Operator Manual

For printer model:

S84 ex / S86 ex



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Before You Start

Thank you for purchasing this SATO S84-ex/S86-ex print engine (hereafter referred to as “the printer”). This manual supplies basic information on how to operate the printer. Read the manual carefully to understand each function before operation.

Features of the Product

This SATO S84-ex/S86-ex print engine is a high-performance, automated print/apply labeling system with a user-friendly design and equipped with versatile functions. This print engine has a durable design for non-stop operation.

The main features of the printer are as follows:

- Equipped with a two-color backlight LCD and a two-color status LED for improved monitoring of the printer status.
- Durable design for harsh environment.
- High-speed throughput printing with maximum 16 ips print speed and adjustable backfeed speed control.
- Print head can be replaced easily without using extra tools.
- New designed sensor cover with nonstick surface that can be easily removed and cleaned without any tools.
- Easily upload/download data to/from an SD card or USB memory, or by using the SATO All In One Tool application.
- Supports remote printer setting through the SATO All In One Tool application or a web browser.
- Supports a multi-language display menu and printing of Asian fonts.
- Supports emulations in standard firmware.
- Supports various communication interfaces.
- Supports SNTP protocol.

Safety Precautions

This section describes how to safely operate the printer. Be sure to read and understand all instructions carefully before you install and use the printer.

Pictographic Symbols
This operator manual and printer labels use a variety of pictographic symbols. These symbols show the safe and correct operation of the printer and how to prevent injury to others and property damage. The symbol explanations are as follows.

Warning	The Warning symbol indicates that you can cause death or serious injury if you do not follow the instruction or procedure.

Caution	The Caution symbol indicates that you can cause injury or property damage if you do not follow the instruction or procedure.

Example Pictographs



The △ pictograph means “Caution is required”. The pictograph includes a specified warning symbol (for example, the left symbol shows electric shock).



The ⃠ pictograph means “Must not be done”. The pictograph includes a specified prohibited symbol (for example, the left symbol means “Disassembly prohibited”).



The ● pictograph means “Must be done”. The pictograph includes a specified mandate action symbol (for example, the left symbol means “Disconnect the power plug from the outlet”).

⚠ Warning

Place the printer on a stable area.



- Place the printer on a stable area. Do not place the printer on an unstable table, slanted surface or an area subject to strong vibration. If the printer falls off or topples, it could cause injury to someone.

Do not place containers filled with liquid on the printer.





- Do not place flower vases, cups, or other containers filled with liquids, on the printer. If any liquid spills into the printer, immediately power off the printer and disconnect the power plug from the outlet. Then contact your SATO reseller or technical support center. If you operate the printer in this condition, it could cause a fire or electric shock.

Do not place objects into the printer.





- Do not place metal or flammable objects inside the printer’s opening. If a foreign object gets into the printer, immediately power off the printer and disconnect the power plug from the outlet. Then contact your SATO reseller or technical support center. If you operate the printer in this condition, it could cause a fire or electric shock.

Do not use other than the specified voltage.



- Do not use other than the specified voltage (AC 100 V - 240 V). Doing so could cause a fire or electric shock.

⚠ Warning

Always ground connections.



- Always connect the printer's ground wire to a ground. Not grounding the ground wire could cause an electric shock.

Handling the power cord



- Do not break or change the power cord. Do not place heavy objects on the power cord, heat it, or pull it. Doing so could cause damage to the power cord and cause a fire or electric shock.
- If the power cord becomes damaged (core is exposed, wires broken, etc.), contact your SATO reseller or technical support center. Using the power cord in this condition could cause a fire or electric shock.
- Do not change, overly bend, twist, or pull the power cord. Using the power cord in such a way could cause a fire or electric shock.

When the printer has been dropped or broken



- If the printer is dropped or broken, immediately power off the printer and disconnect the power plug from the outlet. Contact your SATO reseller or technical support center. Using the printer in this condition could cause a fire or electric shock.

Do not use the printer when something is unusual about it.



- Continuing to use the printer in the event something is unusual about it, such as smoke or unusual smells coming from it, could cause a fire or electric shock. Immediately power off the printer and disconnect the power plug from the outlet. Then contact your SATO reseller or technical support center for repairs. Under no circumstances should you attempt repairs on your own; it is too dangerous.

Do not disassemble the printer.



- Do not disassemble or modify the printer. Doing so could cause a fire or electric shock. Contact your SATO reseller or technical support center to perform internal inspections, adjustments, and repairs.

Using the head cleaning fluid



- Use of flame or heat around the head cleaning fluid is prohibited. Do not heat it or subject it to flames.
- Keep the fluid out of reach of children. If a child accidentally drinks the fluid, immediately consult with a physician.

Print head



- The print head will become hot after printing. Be careful not to touch it when replacing media or cleaning immediately after printing, to avoid being burned.
- Touching the edge of the print head immediately after printing could cause an injury. Use caution when replacing the media or cleaning the print head.
- Never replace the print head if you have not received the correct training.

⚠ Caution

Do not use in areas of high humidity.



- Do not use the printer in areas of high humidity or where condensation forms. If condensation forms, immediately power off the printer and do not use the printer until it dries. Using the printer while condensation is on it could cause an electric shock.

Carrying the printer





- When moving the printer, always disconnect the power cord from the outlet and check to make sure that all external wires are disconnected before moving it. Moving the printer with the wires still connected could cause damage to the cords or connecting wires, resulting in a fire or electric shock.
- Do not carry the printer while it contains media. The media could fall out and cause an injury.
- When setting the printer on the floor or a stand, be sure not to get your fingers or hands pinched under the printer feet.

Power supply



- If your hands are wet, do not operate the power switch, connect the power cord or disconnect the power cord. Doing so could cause an electric shock.

Power cord





- Keep the power cord away from hot devices. Placing the power cord near hot devices could cause the cord's covering to melt and cause a fire or electric shock.
- When disconnecting the power cord from the outlet, be sure to hold the plug. Pulling the cord could expose or break the wires and cause a fire or electric shock.
- The power cord set that comes with the printer is designed especially for this printer. Do not use it with any other electrical devices.

Top cover



- Be careful not to get your fingers pinched when opening or closing the top cover. Also be careful that the top cover does not slip off and drop.

Loading media



- When loading a media roll, be careful not to get your fingers pinched between the media roll and the supply unit.

When not using the printer for a long time



- When not using the printer for a long time, disconnect the power cord from the outlet to maintain safety.

During maintenance and cleaning



- When maintaining and cleaning the printer, disconnect the power cord from the outlet to maintain safety.

Precautions for Installation and Handling

Printer operation can be affected by the printer environment.
Refer to the following instructions for installation and handling of the S84-ex/S86-ex printer.

Select a Safe Location

Place the printer on a surface that is flat and level.

If the surface is not flat and level, this may cause bad print quality. This may also cause a malfunction and decrease the life span of the printer.

Do not place the printer on a location that produces vibration.

Giving serious vibration or shock to the printer may cause a malfunction and shorten the life span of the printer.

Keep the printer out of high temperature and humidity.

Avoid locations subject to extreme or fast changes in temperature or humidity.

Do not place the printer in a location subject to water or oil.

Do not place the printer in a location where it will be exposed to water or oil. Water or oil entering inside the printer may cause a fire, electric shock or malfunction.

Avoid dust.

Dust build up may result in bad print quality.

Keep out of direct sunlight.

This printer has a built-in optical sensor. Exposure to direct sunlight will make the sensor less responsive and may cause the media to be sensed incorrectly. Close the top cover when printing.

Power Supply

This printer requires an AC power supply.

Be sure to connect the printer to an AC power supply.

Connect the power cord to a grounded power outlet.

Make sure that the printer is connected to a grounded power outlet.

Supply a stable source of electricity to the printer.

When using the printer, do not share its power outlet with other electrical devices that could cause power fluctuations and performance issues with your printer.

Regulatory Approval

FCC Warning

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Statement for Optional Wireless LAN

This device complies with RF radiation exposure limits set forth for an uncontrolled environment.

The antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all people and must not be collocated or operating in conjunction with any other antenna or transmitter.

Bluetooth/Wireless Communication

Compliance Statement
This product has been certified for compliance with the relevant radio interference regulations of your country or region. To make sure continued compliance, do not:

- Disassemble or modify this product.
- Remove the certificate label (serial number seal) affixed to this product.

Use of this product near microwave and/or other wireless LAN equipment, or where static electricity or radio interference is present, may shorten the communication distance, or even disable communication.

Industry Canada (IC) Statement for Bluetooth

This device complies with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions:
- This device may not cause interference.
- This device must accept any interference, including interference that may cause undesired operation of the device.

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the IC radio frequency (RF) Exposure rules. This equipment should be installed and operated keeping the radiator at least 20 cm or more away from person's body (excluding extremities: hands, wrists, feet and ankles).

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
- L'appareil ne doit pas produire de brouillage.
- L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'IC. Cet équipement doit être installé et utilisé en gardant une distance de 20 cm ou plus entre le dispositif rayonnant et le corps (à l'exception des extrémités : mains, poignets, pieds et chevilles).

Disposal of Old Electrical & Electronic Equipment (Applicable in the European Union and other European countries with separate collection systems)



A product marked with this symbol on itself or on its packaging shall not be treated as household waste. Instead it shall be handed over to an appropriate collection point for the recycling of electrical and electronic equipment in accordance with local regulations. Inappropriate waste handling of this product may cause detrimental consequences for the environment and damage to human health. The recycling of materials will help to conserve natural resources and contribute to your community. For more detailed information on recycling of this product, contact your local municipal organization, your household waste disposal service or the dealer where you purchased the product.

EN55022 Warning

This is a class A product.

In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

EN55022 Warnung

Warnung! Dies ist eine Einrichtung der Klasse A.

Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen. In diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen.

Das Gerät ist nicht für die Benutzung im unmittelbaren Gesichtsfeld am Bildschirmarbeitsplatz vorgesehen. Um störende Reflexionen am Bildschirmarbeitsplatz zu vermeiden, darf dieses Produkt nicht im unmittelbaren Gesichtsfeld platziert werden.

机器名称:条形码打印机

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr6+)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板	×	○	○	○	○	○
电源、交流转换器电池	×	○	○	○	○	○
热敏头、液晶显示屏	×	○	○	○	○	○
电动机、切纸机	×	○	○	○	○	○
树脂(ABS、PC等)	×	○	○	○	○	○
金属(铁、非铁金属)	×	○	○	○	○	○
电缆等	○	○	○	○	○	×
包装材料(纸盒等)	○	○	○	○	○	○

○：表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006 “电子信息产品中有毒有害物质的限量要求”的标准规定以下。

×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006“电子信息产品中有毒有害物质的限量要求”的标准规定。

环保使用期限



本标志中的年数，是根据2006年2月28日公布的“电子信息产品污染防止管理办法”和SJ/T11364-2006“产品污染防止标识要求”，适用于在中华人民共和国（除台湾、香港和澳门外）生产或进口的电子信息产品的“环保使用期限”。在遵守使用说明书中记载的有关本产品安全和使用上的注意事项、且没有其他法律和规定的免责事由的情况下，在从生产日开始的上述年限内，产品的有毒、有害物质或元素不会发生外泄或突变，使用该产品不会对环境造成严重污染或对使用者人身、财产造成严重损害。

注1): “环保使用期限”不是安全使用期限。尤其不同于基于电气性能安全、电磁安全等因素而被限定的使用期限。产品在经适当使同后予以废弃时, 希望依照有关电子信息产品的回收和再利用的法律与规定进行处理。

注2): 本标志中的年数为“环保使用期限”，不是产品的质量保证期限。对于同一包装内包含电池、充电器等附属品的产品，产品和附属品的环保使用期限可能不同。

1 Parts Identification

1.1 Printer Orientation

This printer has two types of orientation as below. The media feed direction varies depending on the type of orientation.



Media feed direction

Americas: Standard/Right Hand
Europe/Asia: Left Hand



Media feed direction

Americas: Opposite/Left Hand
Europe/Asia: Right Hand

Note

The pictures in this manual show the S84-ex (Americas: Standard/Right Hand, Europe: Left Hand) printer, unless otherwise stated.
When using the right hand (Americas: Opposite/Left Hand, Europe: Right Hand) model, the picture on the right shows a symmetrical opposite view of your printer.
When using the S86-ex printer, the dimension of the media compartment is larger.

1.2 Parts Identification of the Printer

1.2.1 Front View



① **Operator panel**

② **LCD**

③ **Top cover**

④ **Power (I/O) switch**
Press this switch to power on (I) or power off (O) the printer.

⑤ **Media discharge outlet**

1.2.2 Rear View



S84-ex/S86-ex
(Americas: Opposite/Left Hand,
Europe/Asia: Right Hand) printer

S84-ex/S86-ex
(Americas: Standard/Right Hand,
Europe/Asia: Left Hand) printer

⑥ **Wireless LAN (optional) antenna**
To install the optional wireless LAN antenna.

⑦ **Fan filter**
To prevent dust from entering the printer.

⑧ **AC input terminal**
Supplies power to the printer through the inserted power cord.

Before connecting, make sure that the AC voltage of your region is in the range of AC 100 to 240 V, 50 to 60 Hz.

⑨ **RS-232C connector**
To connect the printer to the host computer using the RS-232C serial interface.

⑩ **IEEE1284 connector**
To connect the printer to the host computer using the IEEE1284 interface.

⑪ **LAN connector**
To connect the printer to the host computer using the LAN interface.

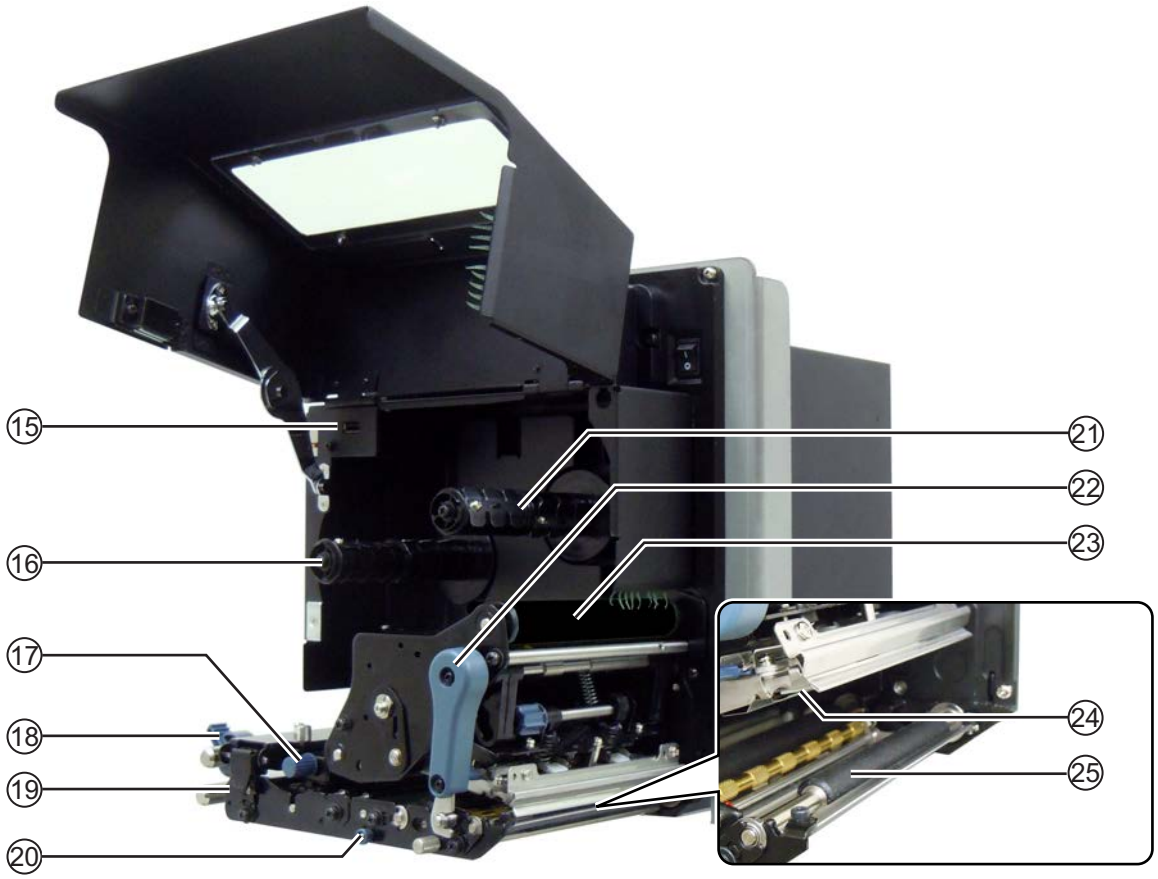
⑫ **SD CARD slot**
To install an SD card for additional memory.

⚠ CAUTION
Be sure to perform a virus check for the SD card before connecting it to the printer. SATO Corporation shall not be held responsible for a malfunction of the printer caused by a virus infection through the SD card.

⑬ **USB connector (Type B)**
To connect the printer to the host computer using the USB interface.

⑭ **EXT connector (External signal interface)**
Interface connector for external signals. Connect the optional applicator to this terminal.

1.2.3 Internal View



⑮ USB connector (Type A)

For connecting to optional USB memory.

⚠ CAUTION

Be sure to perform a virus check for the USB memory before connecting it to the printer. SATO Corporation shall not be held responsible for a malfunction of the printer caused by a virus infection through the USB memory.

⑯ Ribbon supply spindle

⑰ Media sensor adjustment knob

Used to adjust the position of the media sensor.

⑱ Media guide

⑲ Feed lock latch

Used to open the feed roller and media sensor assembly.

⑳ Pressure roller release tab

Used to release the pressure plate.

㉑ Ribbon rewind spindle

㉒ Head lock lever

Used to release the print head assembly.

㉓ Ribbon roller

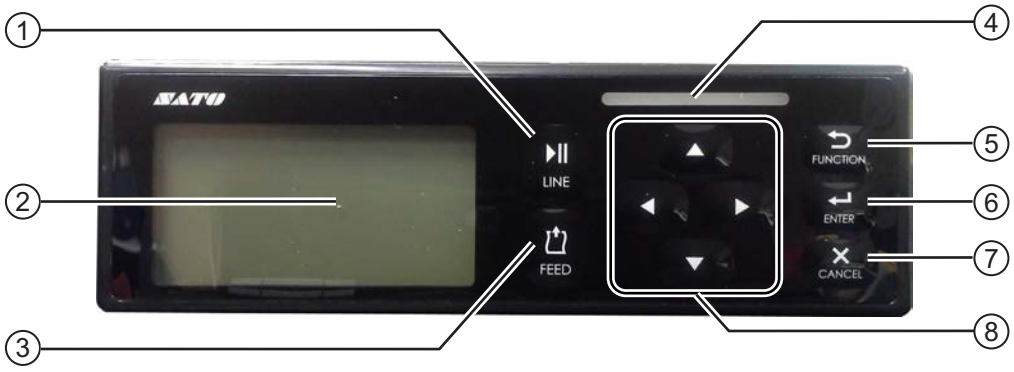
㉔ Print head (Consumables)

The part to print on the media. Perform regular maintenance.

㉕ Platen roller (Consumables)

1.3 Parts on the Operator Panel

1.3.1 Operator Panel



Note: Remove the protective sheet from the operator panel before use.

① **⏯ LINE button**

Toggle between online/offline mode.

② **LCD**

③ **FEED button**

Feed a piece of media when the printer is in offline mode.

④ **LED indicator**

⑤ **⮌ FUNCTION button**

Operates the set function when the printer is in normal mode.

Returns to the setting mode menu from the setting screens.

⑥ **↵ ENTER button**

Enter the setting mode menu when the printer is in offline mode.

Confirm the selected item or setting value when the printer is in setting mode.

⑦ **✕ CANCEL button**

Go to the CANCEL PRINT JOB screen when the printer is in offline mode.

Returns to the previous setting screen when the printer is in setting mode.

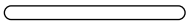
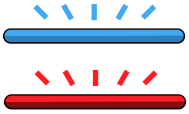
⑧ **◀/▶/▲/▼ Arrow buttons**

Navigate the selection or set numbers in the screen menu.

Press the ▲ button to adjust the buzzer volume when the printer is in normal mode.

Press the ▲ and ▼ buttons for one second to enter the adjustment mode when the printer is in normal mode.

1.3.2 LED Indicator

LED Indicator	Color	Description
	Blue	Power on or online mode
	(Light off)	Power off or offline mode
	Red	Printer error (For example, when a machine error is detected)
 Flashes at intervals of two seconds.	Red	Printer error (For example, when the ribbon runs out)
 Alternately flashes blue and red.	Blue and red	Printer error (For example, when a communication error has occurred)

2 Installing the Printer

2.1 Installation Precautions

Install this printer in a location as follows:

- A location that is horizontal and stable.
  When you install the printer onto a support structure/applicator, the complete assembly must be sturdy and stable.
  Attach the support structure firmly to the floor or on production machinery.

- A location that has sufficient space for operating the printer.
  Install the printer so that the media dispenser side is within the designated distance and height relative to the applicator.
  Install the media supply dispensers with an operational distance to the printer's input side.

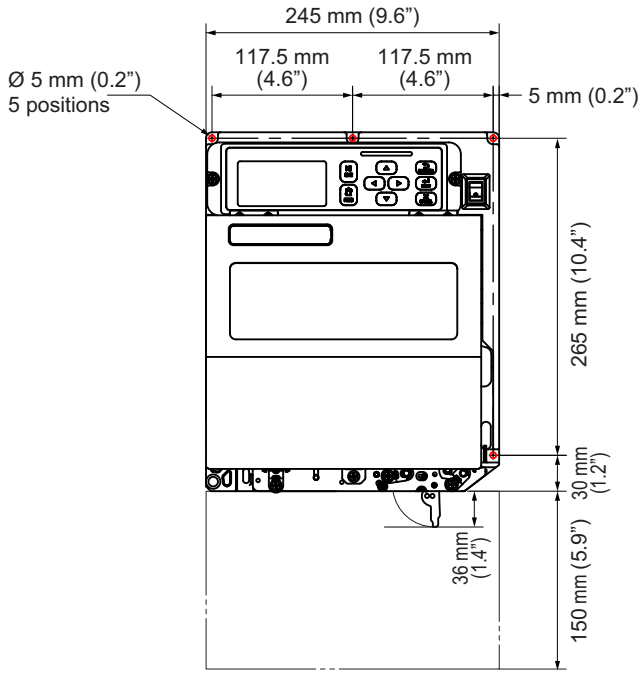
Do not install this printer in a location as follows. Doing so could cause the printer to malfunction.

- A location that is subject to vibration.
- A location with high temperature and humidity.
- A dusty location.
- A location exposed to direct sunlight.
- A location with a lot of electrical noise.
- A location with a large fluctuation in power.

2.2 Installation Space

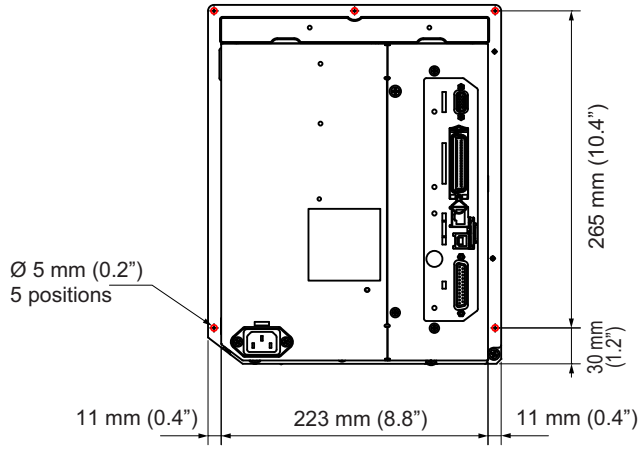
Make sure that there is sufficient space around the printer so that the top cover can be fully opened when operating or cleaning the printer, or replacing consumables. And make sure that there is sufficient space on the rear side of the printer so that the rear housing cover can be fully opened during maintenance.
The illustrations in this section show the printer from different angles, providing dimensions and spatial requirements.

2.2.1 Front View (S84-ex/S86-ex printer)



Americas: Standard/Right Hand
Europe/Asia: Left Hand

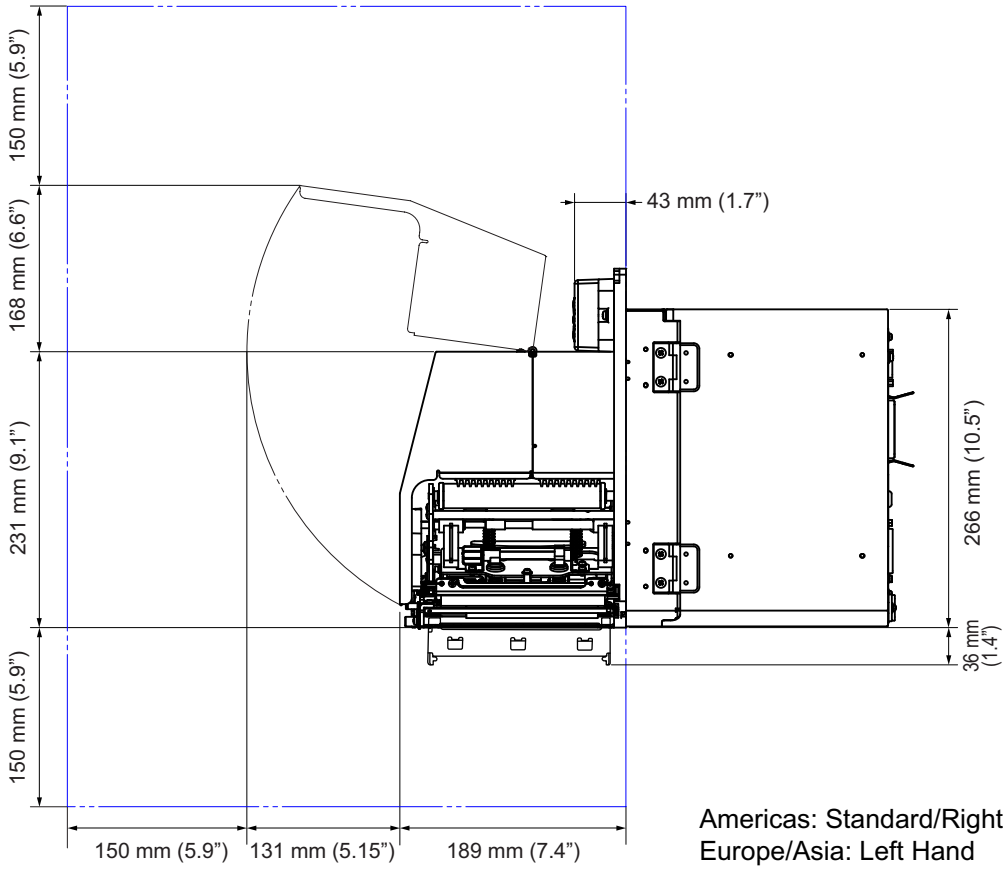
2.2.2 Rear View (S84-ex/S86-ex printer)



O indicates five positions of bores for installing the printer to a support structure.

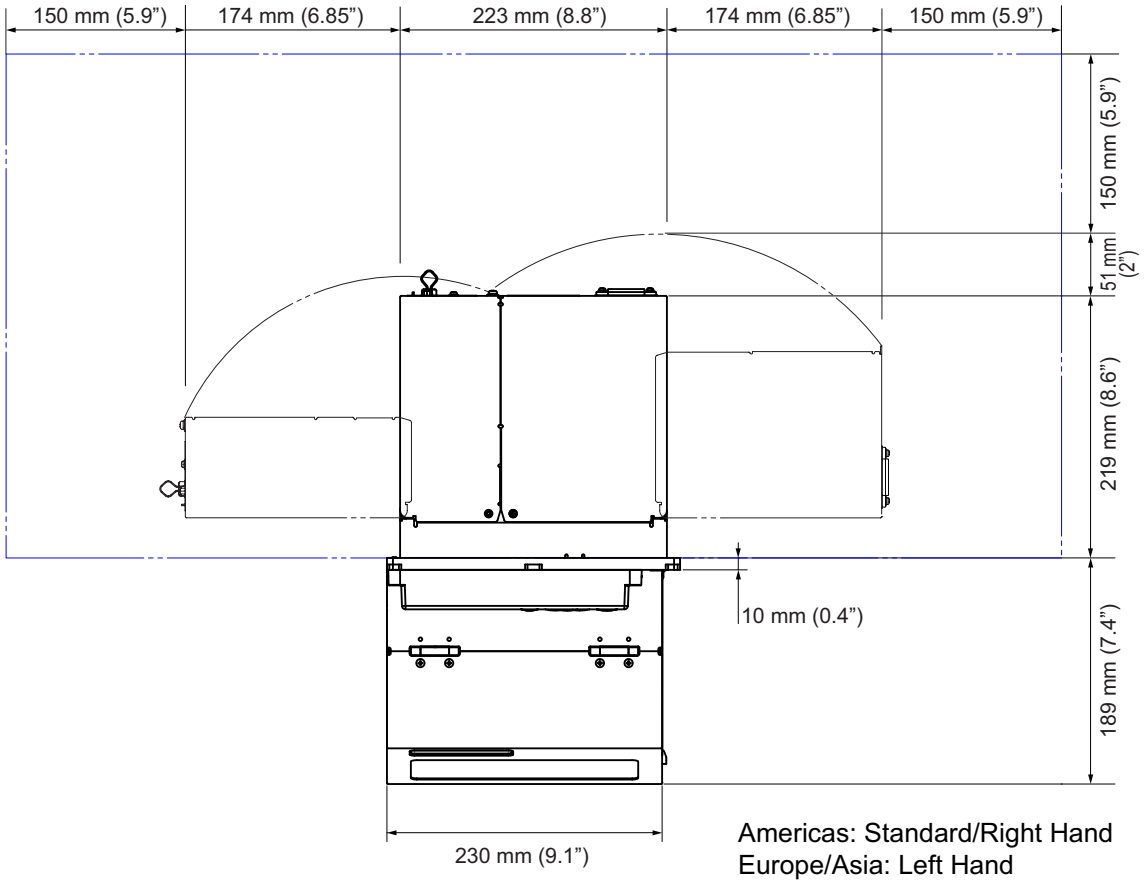
Americas: Standard/Right Hand
Europe/Asia: Left Hand

2.2.3 Media Dispensed View (S84-ex printer)

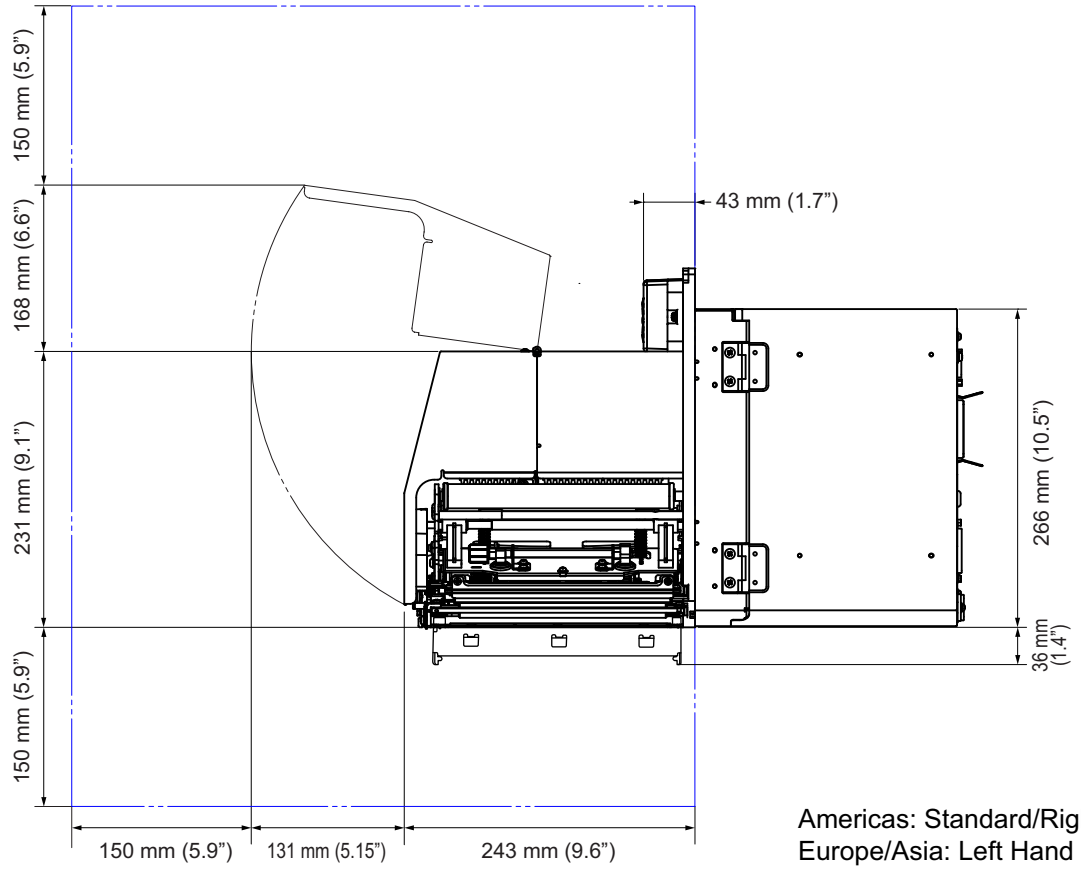


Americas: Standard/Right Hand
Europe/Asia: Left Hand

2.2.4 Top View (S84-ex printer)

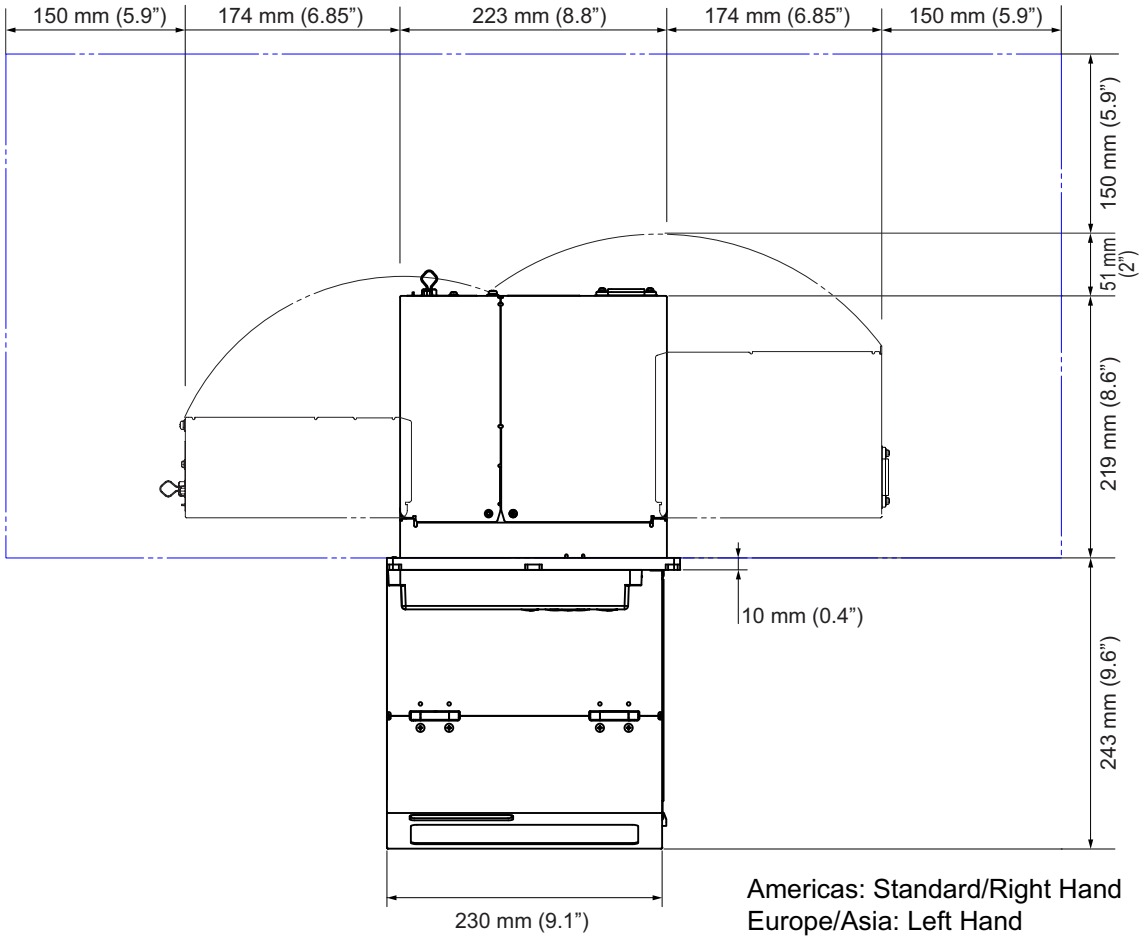


2.2.5 Media Dispensed View (S86-ex printer)



Americas: Standard/Right Hand
Europe/Asia: Left Hand

2.2.6 Top View (S86-ex printer)



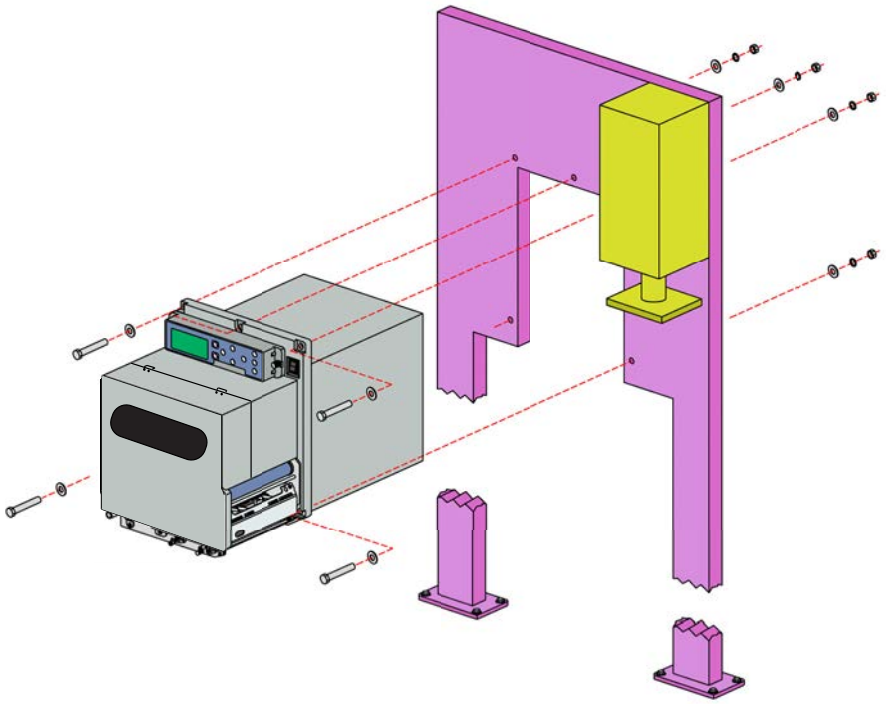
2.3 Installing the Printer onto a Support Structure/Applicator

This printer must be installed onto a support structure/applicator for correct operation.
The printer has five bores on the center frame for installing to a support structure.
Attach five bolts to the five bores on the center frame to install the printer onto the support structure.

⚠ WARNING

Make sure that you use the designated bolts that can accommodate the weight of the printer.
If you do not install the printer correctly, it could fall out of the support structure. This may cause injury.

The picture below shows the installation of the printer onto the support structure.



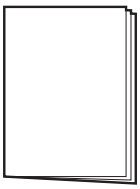
Note

This picture is for an instructional display purpose only and is not to be interpreted as a precise example.

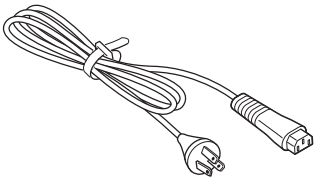
2.4 Checking the Bundled Accessories

After unpacking the printer, make sure that you have all the bundled accessories. If there are missing items, contact the SATO reseller where you purchased the printer.

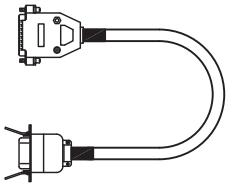
User documents
(Quick guide, Warranty, etc.)



AC power cord*



14-pin conversion cable



Ribbon core



* The shape of power plug varies depending on the region in which it was purchased.

Note

Keep the packaging box and cushioning material after installing the printer. You can pack the printer with this packaging box for shipment when requesting for repairs.

2.5 Connecting the Interface Cable

The connection of the interface cable is explained as follows:

2.5.1 Available Interfaces

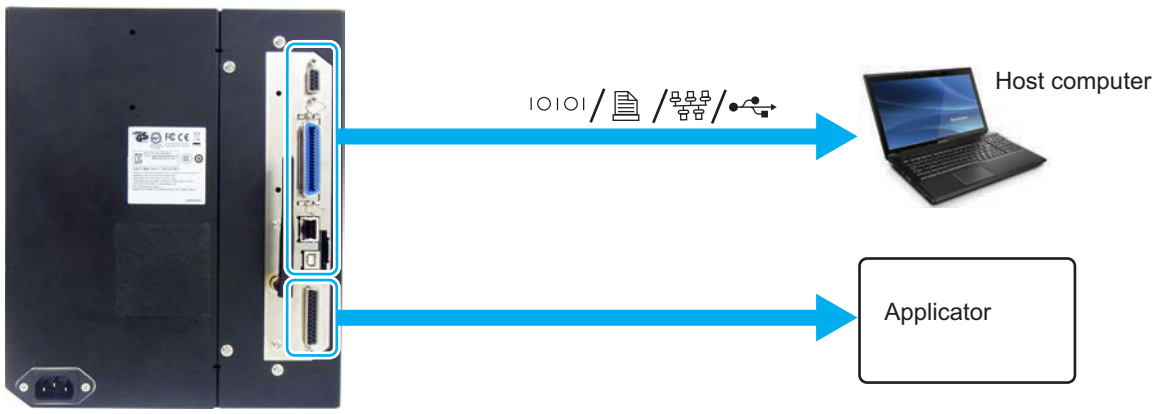
This printer supports the following interfaces.
Furthermore, a printer connected with multiple interface cables can continue to operate when receiving data.
*You cannot receive data from more than one interface at a time.
*You cannot use the USB interface if you have installed the optional wireless LAN.

- USB
- LAN
- RS-232C
- IEEE1284
- Bluetooth
- Wireless LAN (WLAN)
- External signal (EXT)

Note

The wireless LAN interface and Bluetooth interface are optional.

2.5.2 Interface Connections



1 Make sure that the printer, host computer and applicator are powered off.

Set the power switch of the printer to the "**O**" position.

2 Connect the printer to a host computer with one or more of the available interface connections.

Use a cable that is compatible with the standard of the interface board as stated in **Section 8.13 Interface Specifications**. Check the orientation of the connector before you make the connection.

3 Connect the applicator cable from the **EXT** connector of the printer to the applicator.

Use a cable that is compatible with the standard of the interface board as stated in **Section 8.13 Interface Specifications**. Check the orientation of the connector before you make the connection.

⚠ CAUTION

Do not connect or disconnect the interface cables (or use a switch box) with power supplied to either the printer or computer. This action may cause damage to the interface circuitry in the printer or computer. The warranty does not cover such damages.

2.5.3 Interface Settings

You can set the various interface settings of the printer through the interface mode menu. For details, refer to **Section 4.2.10 Interface Mode**.

In interface mode, you need to configure both the data port and sub port. An overview of each port is shown below.

Data port

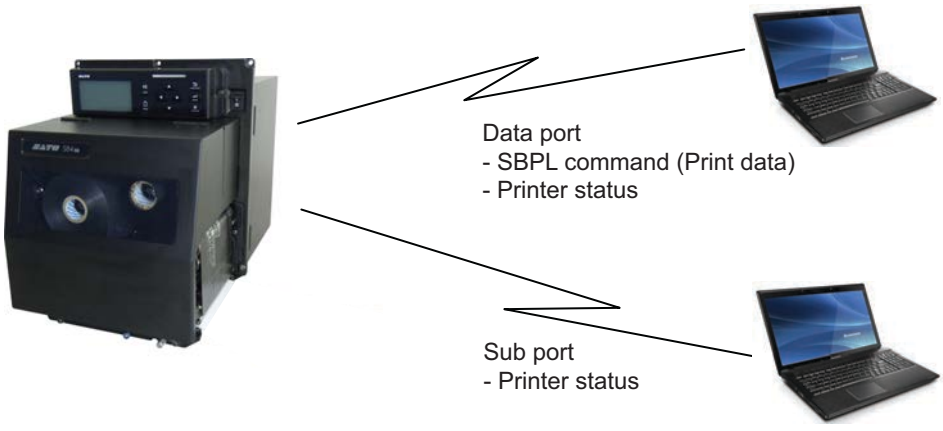
When the interface is set to the data port, it can receive various SBPL commands and receive print data from the host computer.
Data port selection: USB, LAN, RS-232C, IEEE1284, Bluetooth, WLAN (Wireless LAN)
The optional Bluetooth and optional wireless LAN are available if you have installed them.
* You cannot select the interface that has already been set for the SUB PORT.

Sub port

This port is for monitoring the printer status.
Sub port selection: NONE, USB, LAN, RS-232C, IEEE1284, Bluetooth, WLAN (Wireless LAN)
The optional Bluetooth and optional wireless LAN are available if you have installed them.
* You cannot select the interface that has already been set for the DATA PORT.

Note

The main port and sub port cannot simultaneously use the same interface.



2.5.4 Interface Combination

The interface combinations that can be used for the data port and sub port are as follows.

		Data Port					
		USB	LAN	RS-232C	IEEE1284	Bluetooth	WLAN
Sub Port	USB	x	o	o	o	o	x
	LAN	o	x	o	o	o	o
	RS-232C	o	o	x	o	o	o
	IEEE1284	o	o	o	x	o	o
	Bluetooth	o	o	o	o	x	o
	WLAN	x	o	o	o	o	x
	NONE	o	o	o	o	o	o

[o: configurable, x: not configurable]

Note

- The optional Bluetooth and optional wireless LAN are available if you have installed them.
- Do not select the same interface for the data port and sub port.
- If you have installed the optional wireless LAN, you cannot use the USB interface. The optional wireless LAN is connected to the printer through the USB.
- The sub port cannot be used if you have set ENABLE in the INTERFACE AUTO SELECT screen.
- When WLAN is configured for the data port or sub port, but the printer is powered on without the wireless LAN adapter, the configured interface setting is changed from WLAN to USB. When USB is configured as the data port or sub port, but the wireless LAN adapter is connected, the configured interface setting is changed from USB to WLAN.

2.6 Connecting the Power Cord

⚠ WARNING

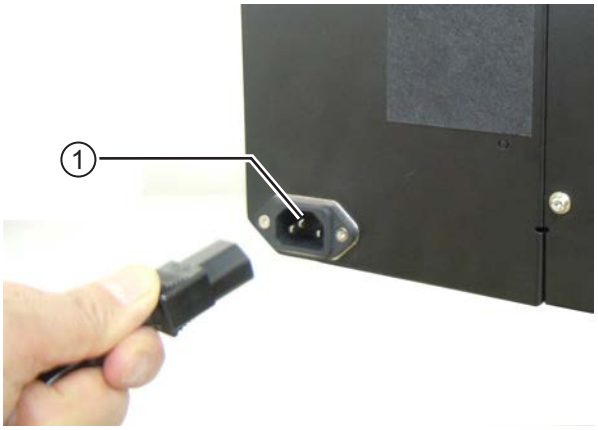
- Do not touch the power switch, connect or disconnect the power cord while your hands are wet. Doing so could cause an electric shock.
- Always connect the ground wire to a ground terminal. Electric shock could occur if you do not.

Note

- The attached power cord is designed exclusively for this printer.
- Do not use the attached power cord with other devices.

1 Connect the power cord to the **AC input terminal** ① at the rear of the printer.

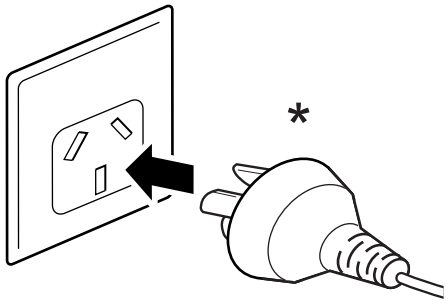
Take note of the orientation of the connector. Secure the printer with one hand, and insert the connector tightly.



2 Insert the power plug into an AC outlet.

Make sure that the AC voltage of your region is in the range of AC 100-240 V, 50-60 Hz. If your local voltage is not in the stated range, contact your SATO reseller or technical support center.

*The shape of the power plug varies depending on the region in which it was purchased.



Note

This product is also designed for IT power distribution system with phase-to-phase voltage 230 V.

2.7 Power On/Off the Printer

⚠ WARNING

Do not touch the power switch, connect or disconnect the power cord while your hands are wet. Doing so could cause an electric shock.

⚠ CAUTION

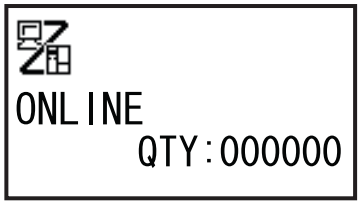
Do not power off the printer during operation, such as when printing or updating. Doing so could cause a malfunction of the printer.

2.7.1 Power On the Printer

1 Press the power switch on the operator panel to "**I**" position.



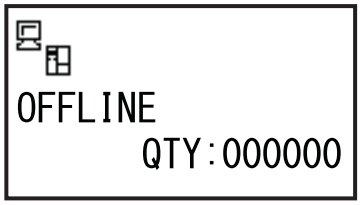
2 **ONLINE** shows on the screen and the LED lights blue.



2.7.2 Power Off the Printer

1 Make sure that the printer is in offline mode before you power off.

If **ONLINE** shows on the screen, press the ⏯ **LINE** button to change to offline mode.



2 Press the power switch on the operator panel to "**O**" position.



2.8 Installing Optional Memory Storage

The optional SD card or USB memory can be used for uploading and downloading data (print format, graphics, extended characters) registered in the printer and printer firmware.
Contact your SATO reseller or service center for the recommended SD card or USB memory.

⚠ CAUTION

Be sure to perform a virus check for the USB memory or SD card before connecting it to the printer. SATO Corporation shall not be held responsible for a malfunction of the printer caused by a virus infection through the USB memory or SD card.

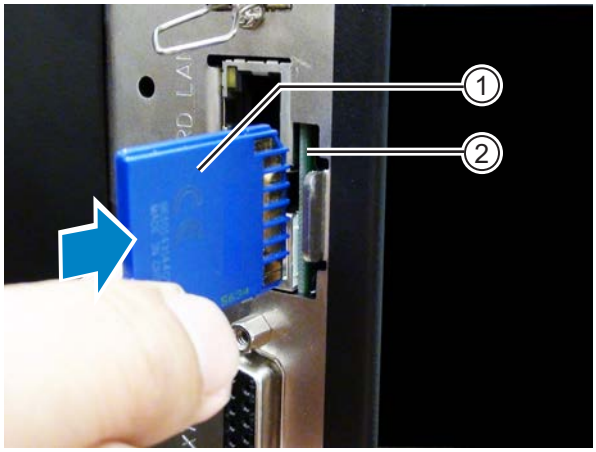
2.8.1 Installing the Optional SD Card

You can install an optional SD card into the SD card slot located on the rear of the printer.
When using the SD card for the first time, format the SD card in the memory card mode. Refer to **Section 4.2.11 Memory Mode** for details.

1 Power off the printer.

2 Insert the optional **SD card** ① into the **SD card slot** ② with the orientation the same as shown in the picture.

Contact your SATO reseller for the recommended SD card.



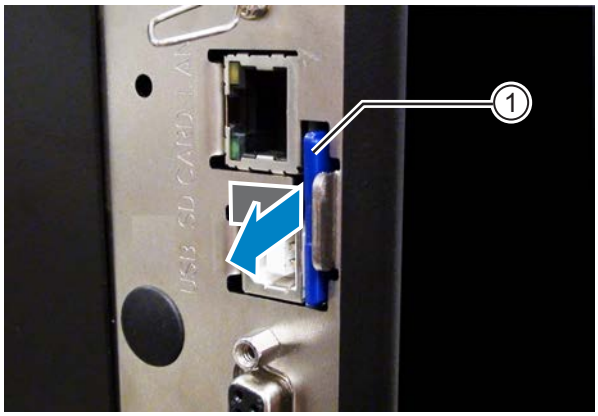
3 To seat the **SD card** in the **SD card slot**, push it in until it makes a slight clicking sound and is almost completely inside the printer.

When seated and ready to operate, only a very small portion protrudes, approximately 3.18 mm (0.125”).

2.8.2 Removing the Optional SD Card

1 Power off the printer.

2 Press the card edge slightly to release the SD card from the SD card slot. The SD card slot will immediately release the **SD card** ①.



⚠ CAUTION

Do not remove the SD card while the printer is accessing the data in the SD card. Doing so may result in data corruption.

2.8.3 Installing the Optional USB Memory

When using the USB memory for the first time, format the USB memory in the memory card mode. Refer to **Section 4.2.11 Memory Mode** for details.

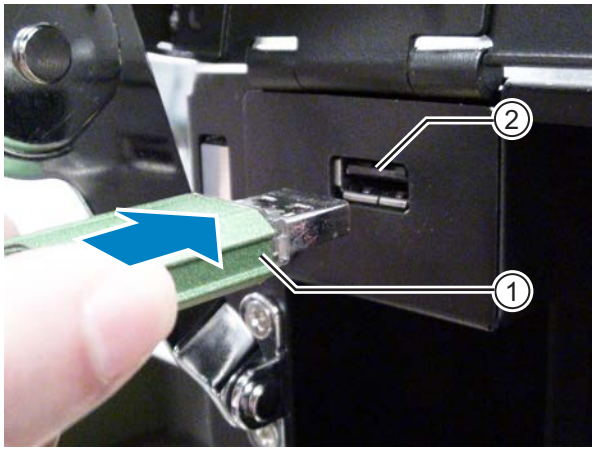
1 Power off the printer.

2 Open the **top cover**.

3 Insert the optional **USB memory** ① into the **USB connector** (Series A plug, 2.0 High-speed) ② on the front of the printer.

Contact your SATO reseller for the recommended USB memory.

4 Close the **top cover**.



To remove the USB memory from the printer

Power off the printer before removing the USB memory.

⚠ CAUTION

Do not remove the USB memory while the printer is accessing the data in the USB memory. Doing so may result in data corruption.

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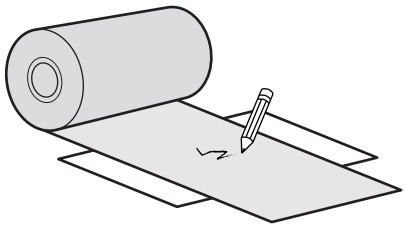
3 Loading the Ribbon and Media

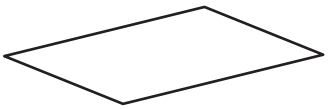
This printer supports two types of print methods, namely thermal transfer and direct thermal. Thermal transfer is a print method that transfers the ink of the ribbon to the media. Direct thermal is a print method that creates the image on direct thermal media. Ribbon is not necessary if you are using direct thermal media.

3.1 Checking the Ink Side of the Ribbon

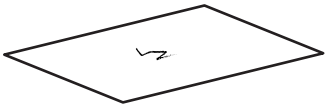
There are two wind directions for the ribbon. Face-out means the ink is on the outer side and Face-in means the ink is on the inner side. This printer supports both wind directions. You can examine the ink side of the ribbon using the following procedure:

1. Place the outer side of the ribbon onto the media (touching).
2. Scratch the inner side of the ribbon with your fingernail or a pointed object.
3. If there is a mark on the media, the ink is coated on the outer side of the ribbon.





The ink is coated on the inner side. (Face-in ribbon)



The ink is coated on the outer side. (Face-out ribbon)

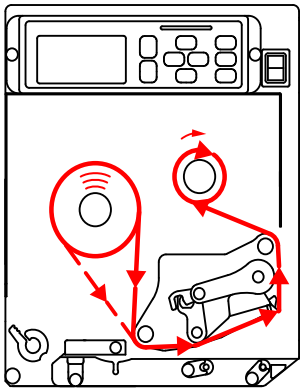
3.2 Loading the Ribbon

Use genuine media and ribbons for the printer, for optimum print quality.

⚠ CAUTION

- The print head and its surroundings are hot after printing. Be careful not to touch it, to avoid being burned.
- Touching the edge of the print head with your bare hand could cause injury.

The routing path of the ribbon is shown in the right picture.



Face-in ribbon

Face-out ribbon

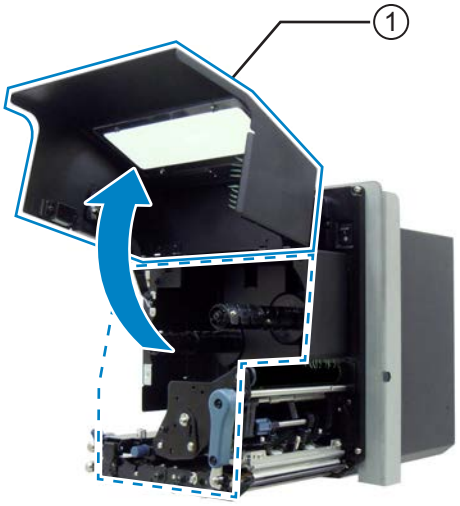
Note

You can also refer to the sticker located on the inner side of the top cover.

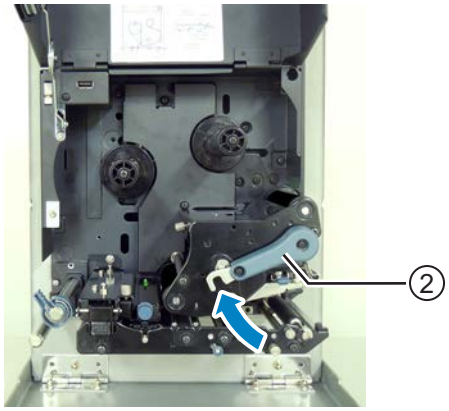
1 Open the **top cover** ①.

⚠ CAUTION

Open the top cover fully to prevent accidental drop of the cover.



2 Turn the **head lock lever** ② clockwise to unlock the print head.

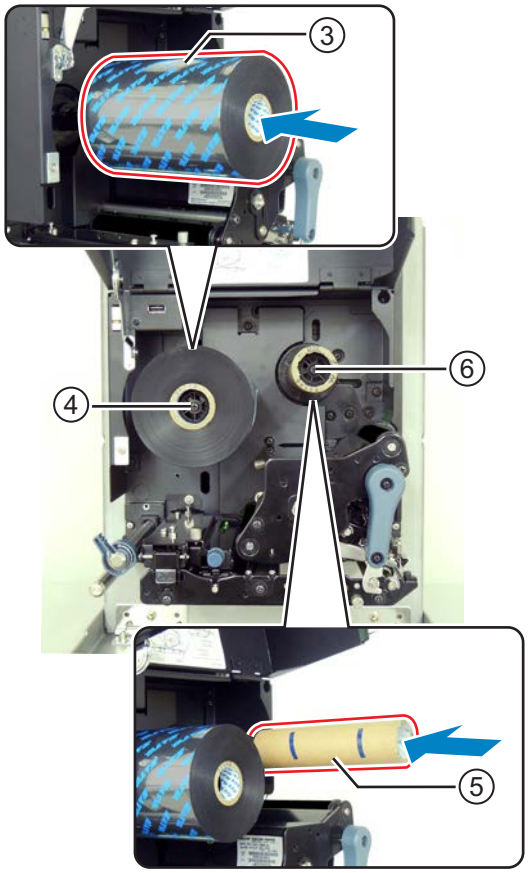


3 Load the **ribbon** ③ onto the **ribbon supply spindle** ④.

While taking note of the wind direction, insert the ribbon all the way in.
Make sure that the ink side of the ribbon is facing down when passing it below the print head.

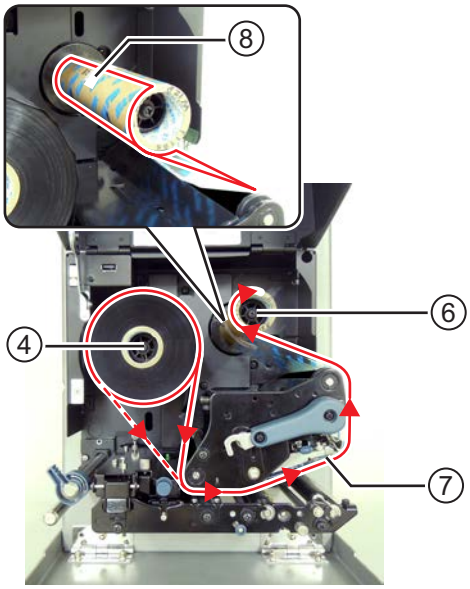
4 Load an **empty ribbon core** ⑤ onto the **ribbon rewind spindle** ⑥.

Insert the core all the way in.

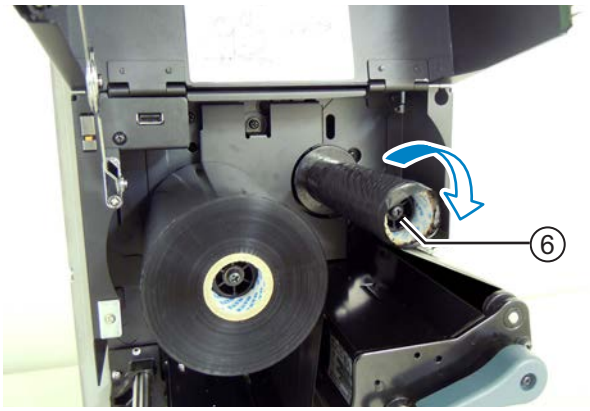


5 From the **ribbon supply spindle** ④, pass the ribbon below the **print head** ⑦ and to the **ribbon rewind spindle** ⑥.

6 Wind the ribbon clockwise around the **empty ribbon core** ⑤ on the **ribbon rewind spindle** ⑥. Attach the free end of the ribbon to the core with adhesive tape ⑧.



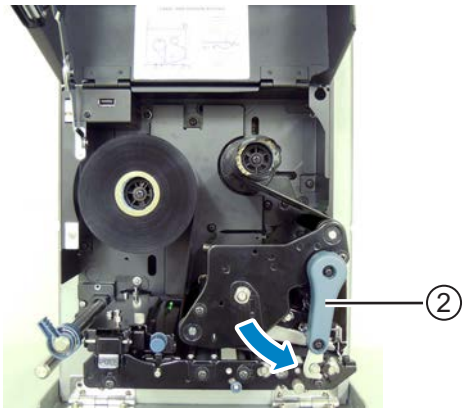
7 Turn the **ribbon rewind spindle** ⑥ clockwise for several rounds, to wind the ribbon.



8 If the media is already loaded, turn the **head lock lever** ② counterclockwise to lock the print head.

If the media is not loaded, continue with **Section 3.5 Loading Media**.

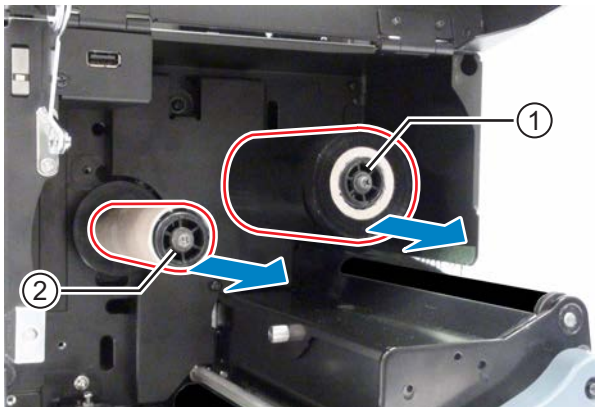
9 Close the **top cover**.



3.3 Removing the Ribbon

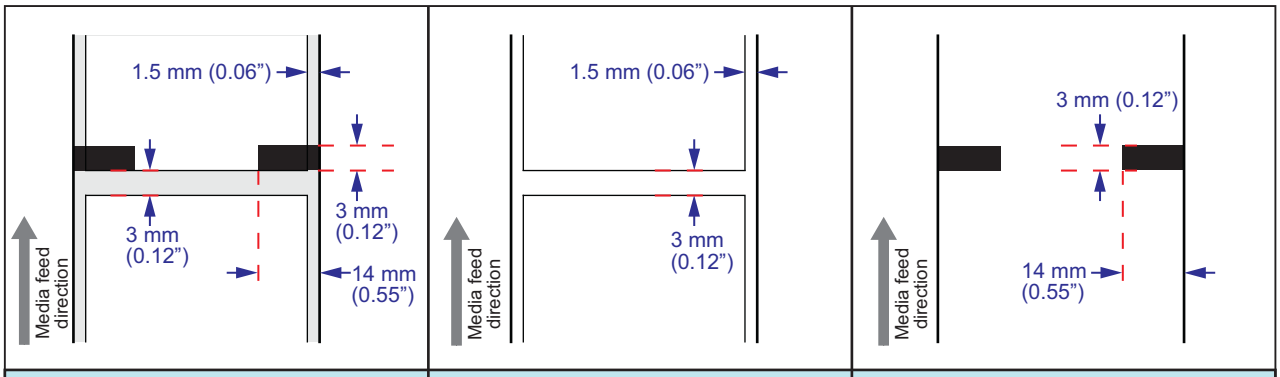
1. Open the **top cover**.
2. Turn the **head lock lever** clockwise to unlock the print head.
3. Pull to remove the used ribbon from the **ribbon rewind spindle** ①.
4. Pull to remove the empty core from the **ribbon supply spindle** ②.

   You can use this empty core again when you load a new ribbon roll. Load this empty core onto the ribbon rewind spindle.



3.4 Usable Media

This printer can print on two types of media; media roll and fan-fold media. The printer uses media sensors to detect I-marks or Gaps on the media in order to precisely print the content.



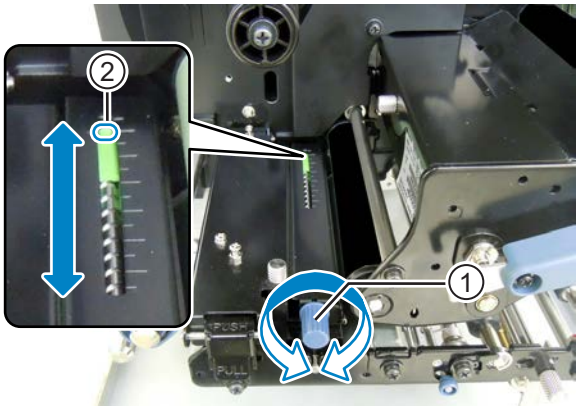
3.4.1 Adjusting the Position of the Media Sensor

Non-standard media are media with printing on the reverse side, or media with special shapes. When using non-standard media, make sure that the media sensor position is aligned with the I-mark or gap of the media.
The I-mark sensor of the printer has a fixed position of 5 mm (0.2”) measured from the printer’s center frame.
The position of the gap sensor is adjustable. You can adjust the gap sensor position in the following range.
S84-ex printer: 5 mm to 66 mm (0.2” to 2.6”) measured from the printer’s center frame.
S86-ex printer: 5 mm to 81 mm (0.2” to 3.2”) measured from the printer’s center frame.

1 Open the **top cover**.

2 Turn the **media sensor adjustment knob** ① clockwise or counterclockwise to adjust the gap sensor position.

The green indicator ② on top of the media sensor assembly shows the position of the gap sensor.



3.5 Loading Media

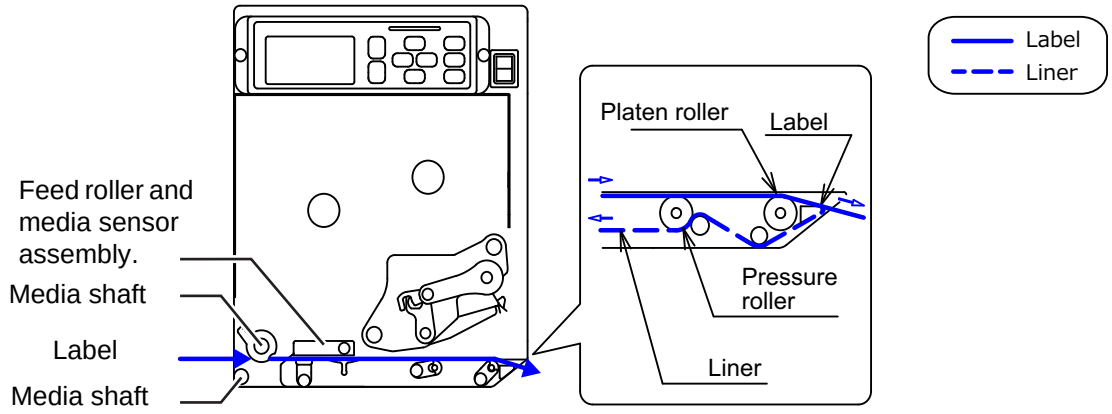
Use genuine media and ribbons for the printer, for optimum print quality.

⚠ CAUTION

- The print head and its surroundings are hot after printing. Be careful not to touch it, to avoid being burned.
- Touching the edge of the print head with your bare hand could cause injury.

3.5.1 Loading Label with Dispenser

This section describes the procedure to dispense the label and eject the liner out of the printer. The routing path of the label is shown below. When loading the media, make sure that the print side is facing up.



1 Open the **top cover**.

⚠ CAUTION

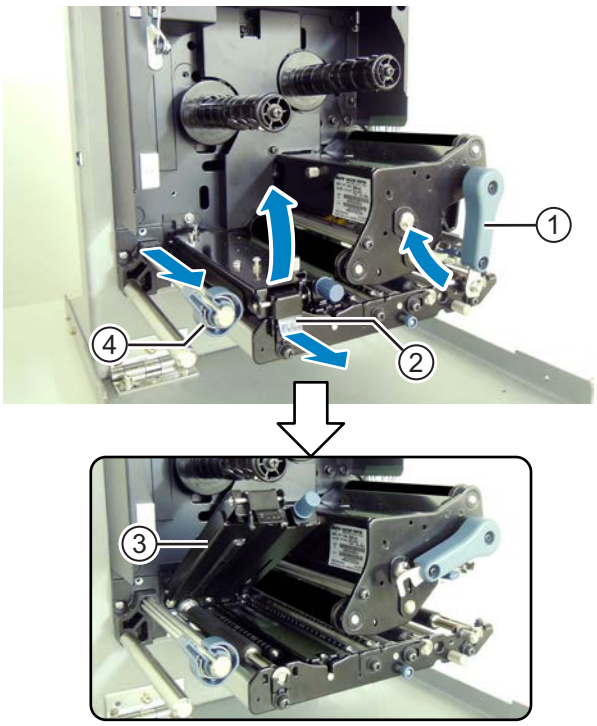
Open the top cover fully to prevent accidental drop of the cover.

2 Turn the **head lock lever** ① clockwise to unlock the print head.

3 Pull the **feed lock latch** ② to unlock the **feed roller and media sensor assembly** ③.

The feed roller and media sensor assembly will flip open.

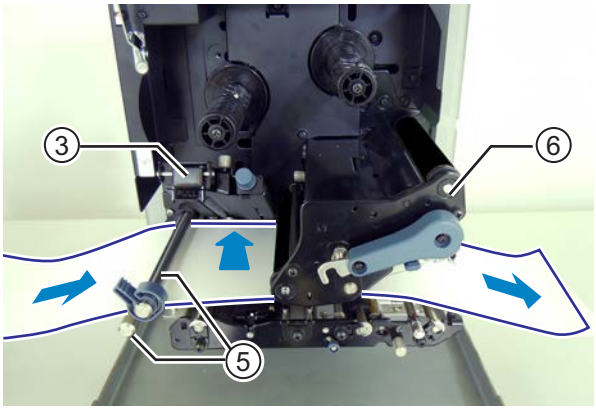
4 Pull the **media guide** ④ away from the printer.



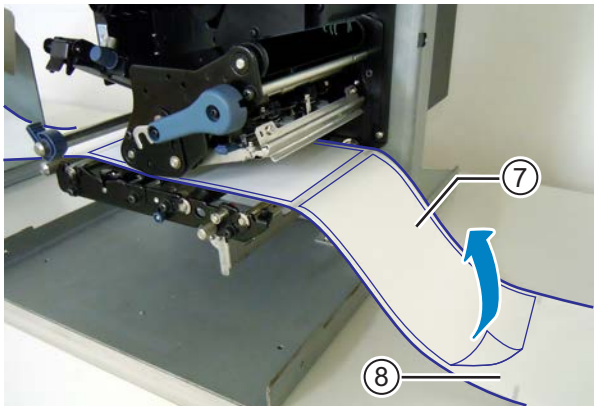
5 Pass the media between the **media shaft** ⑤, below the **feed roller and media sensor assembly** ③, and the **print head assembly** ⑥ and extend it out the discharge outlet.

Make sure that the end of the media extends out the discharge outlet.

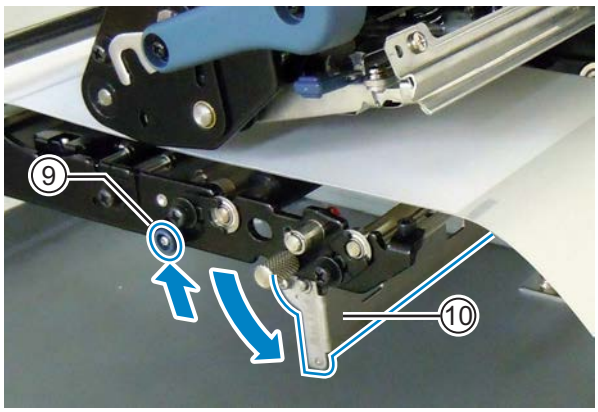
6 Push the media until the innermost edge of the media lightly touches the printer center frame.



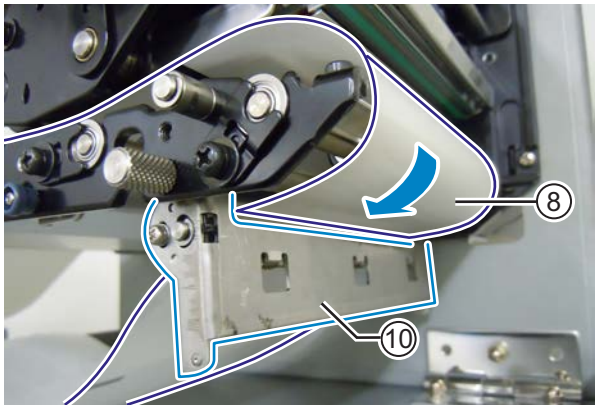
7 Pull the label out from the discharge outlet. Remove about 30 cm (11.8”) of **labels** ⑦ from the **liner** ⑧.



8 Push the **pressure roller release tab** ⑨ up to release the **pressure roller plate** ⑩.



9 Pass the **liner** ⑧ through the gap of the **pressure roller plate** ⑩.



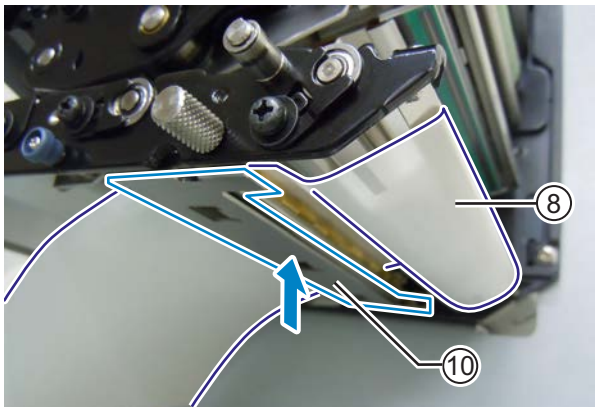
10 Push the center of the **pressure roller plate** ⑩ to latch it in place.

11 Turn the **head lock lever** counterclockwise to lock the print head.

12 Close the **top cover**.

13 After loading the media and ribbon, perform a test print to make sure that the media is loaded correctly.

Refer to the **Section 4.2.17 Test Print Mode** for details on how to perform a test print.

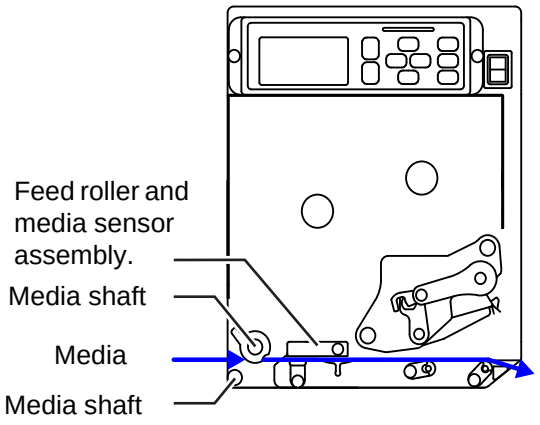


⚠ CAUTION

When closing the top cover, be careful not to pinch your fingers.

3.5.2 Loading Media without Using Dispenser

This section describes the procedure to just load the media without using the dispenser. The routing path of the media is shown in the right picture.
When loading the media, make sure that the print side is facing up.



1 Refer to steps 1 through 6 of **Section 3.5.1 Loading Label with Dispenser** to load the media.

2 Turn the **head lock lever** ① counterclockwise to lock the print head.

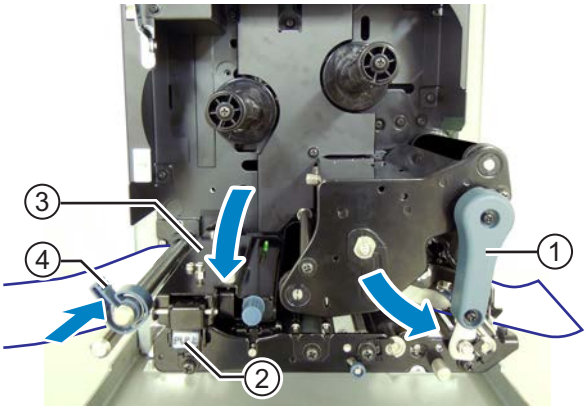
3 Press the **feed roller and media sensor assembly** ③ down until the **feed lock latch** ② is locked.

4 Push the **media guide** ④ lightly against the outermost edge of the media.

5 Close the **top cover**.

6 After loading the media and ribbon, perform a test print to make sure that the media is loaded correctly.

Refer to the **Section 4.2.17 Test Print Mode** for details on how to perform a test print.



⚠ CAUTION

When closing the top cover, be careful not to pinch your fingers.

4 Operation and Configuration

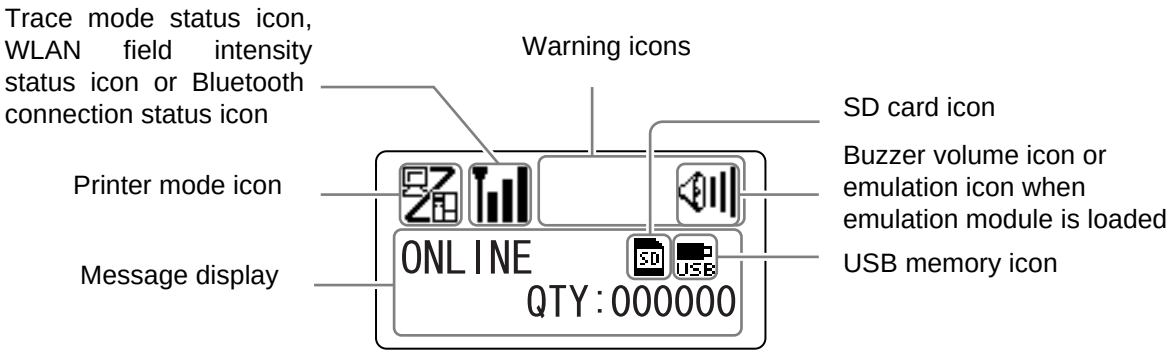
4.1 Display and Operation

The display of the printer varies depending on the following modes:

- Normal mode: refer to **Section 4.1.1 Normal Mode Display and Icons**.
- Setting mode menu: refer to **Section 4.1.2 Setting Mode Menu and Icons**.
- Error display: refer to **Section 4.1.3 Error Display and Icons**.
- Setting display: refer to **Section 4.1.4 Setting Display**.

4.1.1 Normal Mode Display and Icons

In normal mode, the screen shows the following printer status.


Trace mode status icon, WLAN field intensity status icon or Bluetooth connection status icon
Warning icons
SD card icon
Printer mode icon
Buzzer volume icon or emulation icon when emulation module is loaded
Message display
USB memory icon
ONLINE
QTY:000000

- Printer mode

Icon	Description
	Shows when the printer is in online mode.
	Shows when the printer is in offline mode.
	Shows when the printer is in test print mode and hex dump print mode.
	Shows when the printer is in download mode.
	Shows when the printer is in upload mode.
	Shows when the printer is in memory mode.

- Trace mode status

Icon	Description
	Shows after receiving any data while trace mode is ENABLE.
	Shows after receiving ESC (1BH) A while trace mode is ENABLE.
	Shows after print operation while trace mode is ENABLE.

- WLAN field intensity status

Icon	Description	Infrastructure Mode	Ad Hoc Mode
	The meaning of this icon differs depending on the wireless LAN mode. In **Infrastructure mode** Shows when the field intensity is more than level 3 and the printer is connected to an access point. In **Ad Hoc mode** Always shows when the printer is connected.	O	O
	Shows when the field intensity is between levels 2 and 3, and the printer is connected to an access point.	O	Not used
	Shows when the field intensity is between levels 1 and 2, and the printer is connected to an access point.	O	Not used
	The meaning of this icon differs depending on the wireless LAN mode. In **Infrastructure mode** Shows when the field intensity is less than level 1 and the printer is connected to an access point. However, it may be possible to communicate depending on the environment. In **Ad Hoc mode** Always shows when the printer is not connected.	O	O
	Shows when the printer is not connected to an access point.	O	Not used

- Bluetooth connection status

Icon	Description
	Shows when Bluetooth is connected.
	Shows when Bluetooth is disconnected.

- Buzzer volume

Icon	Description
	Shows when the volume is level 3 (Loud).
	Shows when the volume is level 2 (Medium).
	Shows when the volume is level 1 (Low).
	Shows when the volume is level 0 (Mute).

- Emulation mode

Icon	Description
	Shows when SZPL emulation module is loaded.
	Shows when SDPL emulation module is loaded.
	Shows when SIPL emulation module is loaded.

- Warning Icons

Icon	Description
	Shows when a ribbon “near end” is detected.
	Shows when a label “near end” is detected.
	Shows when a command error is detected.
	Shows when a receive buffer “near full” is detected.
	Shows when print head damage is detected.
	Shows when an incompatible print head is detected.

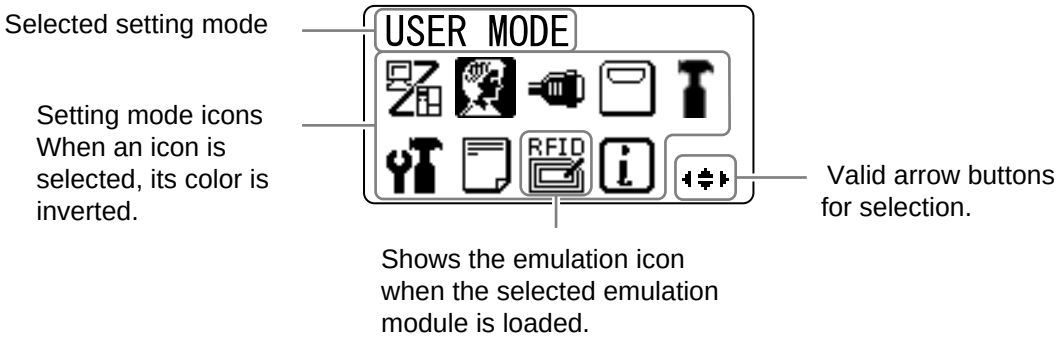
- Memory card status

Icon	Description
	Shows when an SD card is inserted.
	Shows when a USB memory is inserted.

Note
- These icons show when the SD card or USB memory is connected.
- These icons do not show when the printer is in an error mode.
- These icons do not show when the trace mode is enabled.
- These icons do not show when the ESC+IM command (for specifying LCD display) is in use.
- These icon colors are inverted when the SD card or USB memory is being accessed.

4.1.2 Setting Mode Menu and Icons

In the setting mode menu, the screen is shown as follows.


Selected setting mode
USER MODE
Setting mode icons
When an icon is selected, its color is inverted.
RFID
Valid arrow buttons for selection.
Shows the emulation icon when the selected emulation module is loaded.

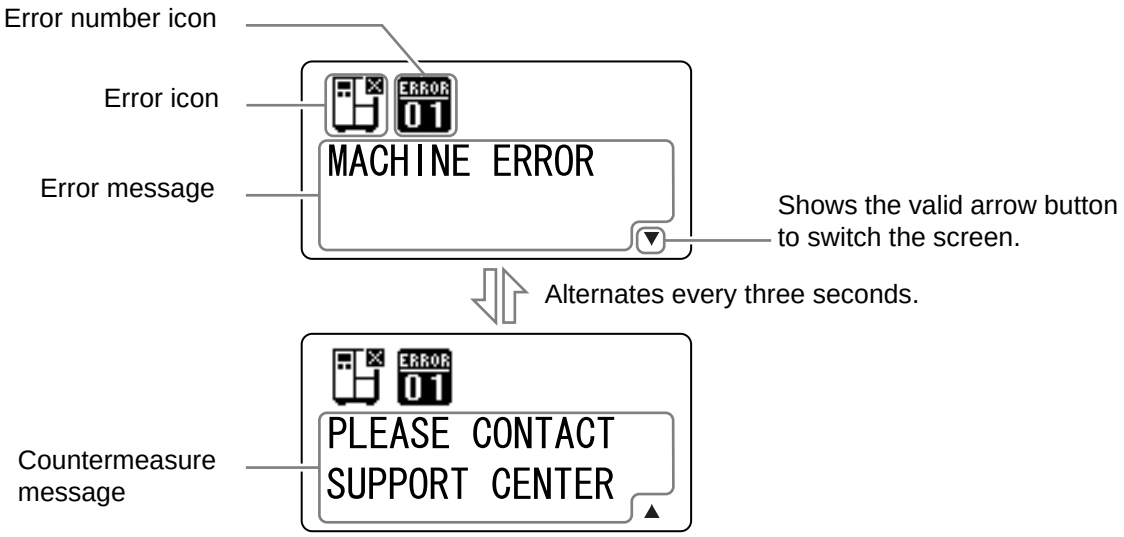
Refer to **Section 4.2.8 Setting Mode Menu** for more details.

- Setting Mode

Icon	Description
	The printer enters the normal mode.
	The printer enters the user mode.
	The printer enters the interface mode.
	The printer enters the memory mode.
	The printer enters the service mode.
	The printer enters the advanced mode.
	The printer enters the hex dump print mode.
	The printer enters the RFID user mode. * Shows only if you have installed the optional RFID kit and enabled the RFID mode.
	The printer enters the loaded emulation mode. * Shows only if you have loaded with the selected emulation firmware module.
	The printer enters the printer information mode.

4.1.3 Error Display and Icons

When a printer error occurs, the screen shows the following error messages and icons.



- Error Icon

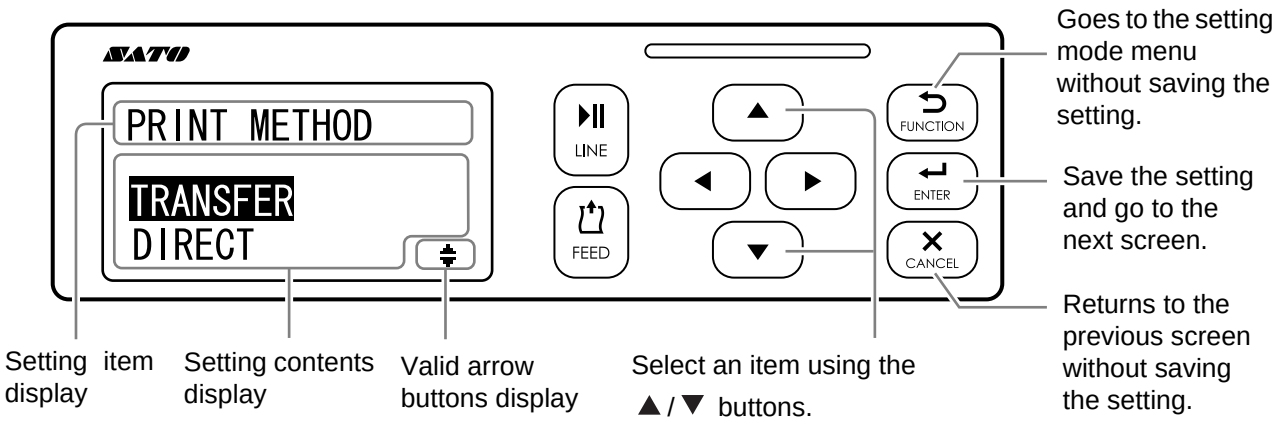
Icon	Description
	Label end or media end is detected.
	Ribbon end is detected.
	Sensor error is detected.
	Print head is unlocked.
	Filament disconnection of the print head is detected.
	Communication error is detected.
	Receive buffer over is detected.
	Item No. error or BCC error is detected.
	Memory card is not accessible or there is no free space in the memory card.
	Writing to the ROM failed or kanji data error is detected.

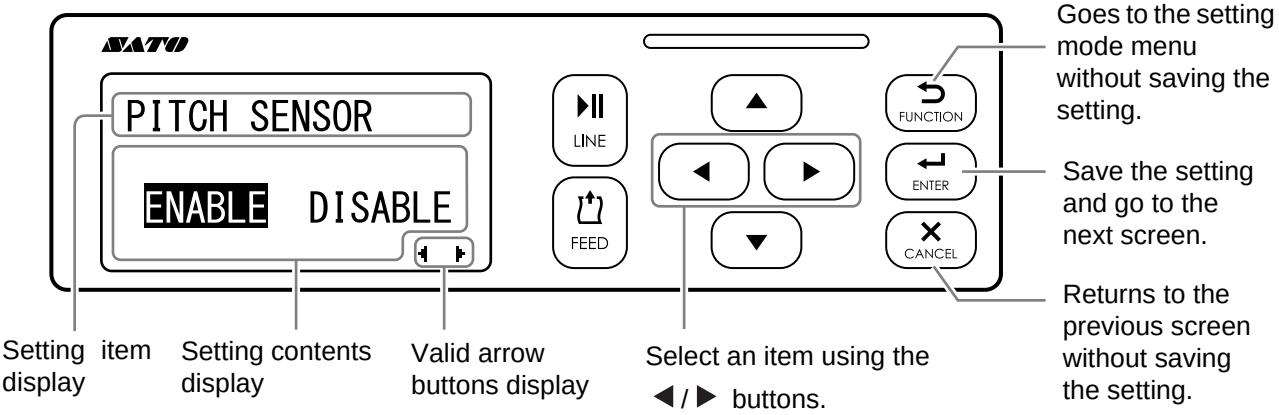
Icon	Description
	Calendar error is detected.
	Writing information to the RFID tag failed.
	Wireless LAN setting error is detected.
	Any printer error other than above is detected.
	Error number according to the errors.

4.1.4 Setting Display

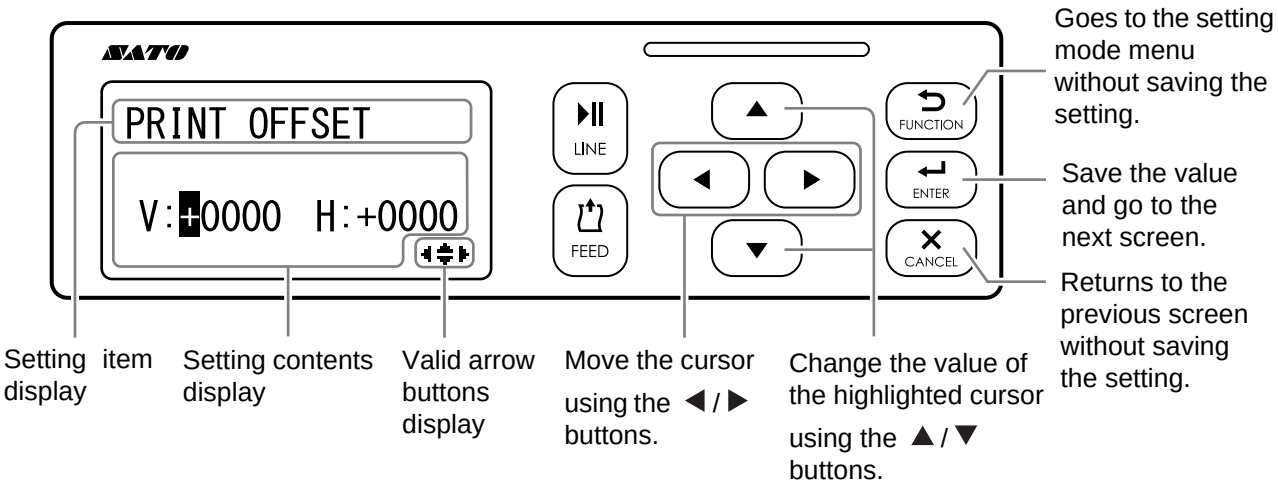
In various setting mode, the setting display is shown as follows. This section also describes the functions of the buttons in setting mode.

- **Selecting an item**





- **Setting values**

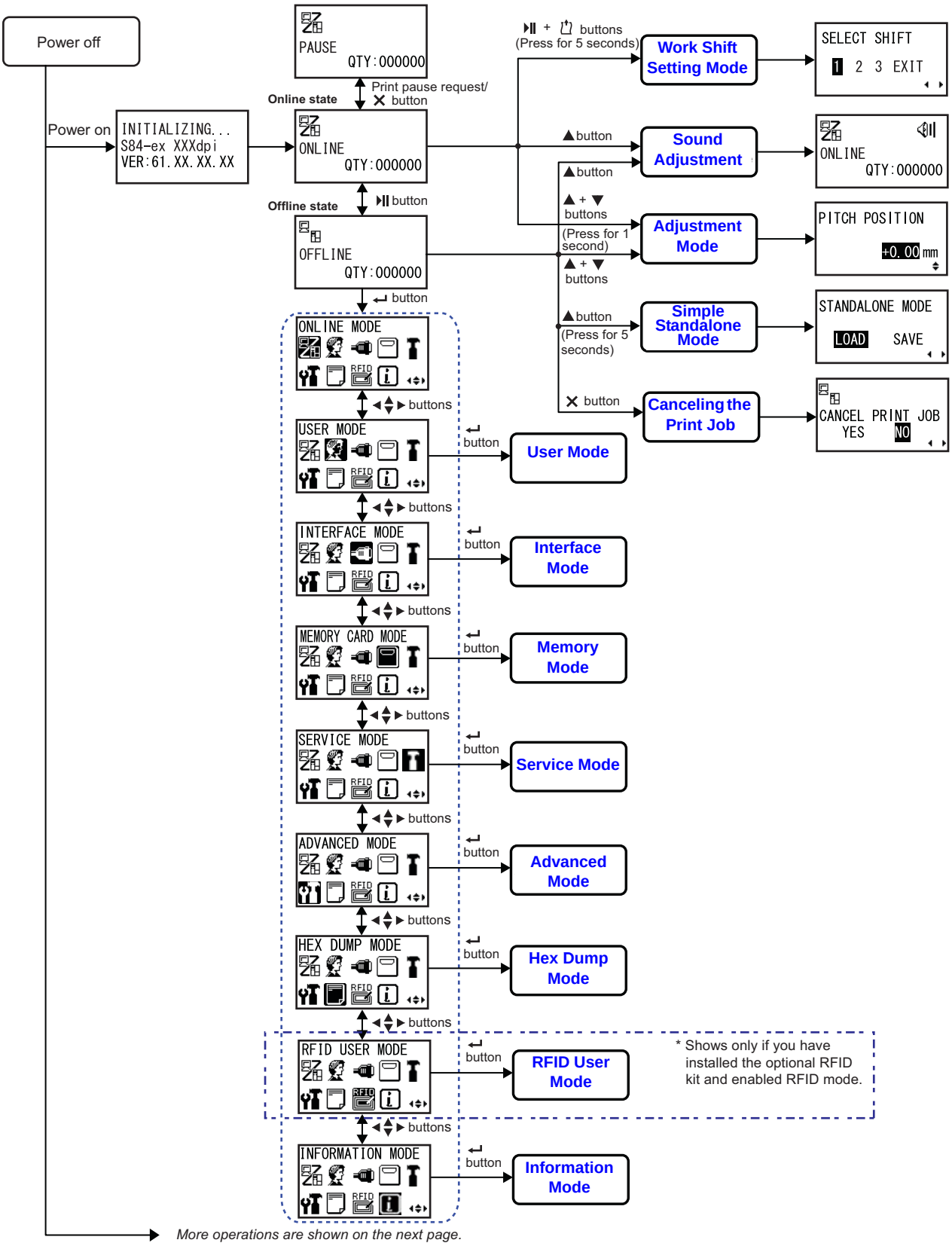

PRINT OFFSET
V:+0000 H:+0000
LINE
FEED
FUNCTION
ENTER
CANCEL
Goes to the setting mode menu without saving the setting.
Save the value and go to the next screen.
Returns to the previous screen without saving the setting.
Setting item display
Setting contents display
Valid arrow buttons display
Move the cursor using the ◀ / ▶ buttons.
Change the value of the highlighted cursor using the ▲ / ▼ buttons.

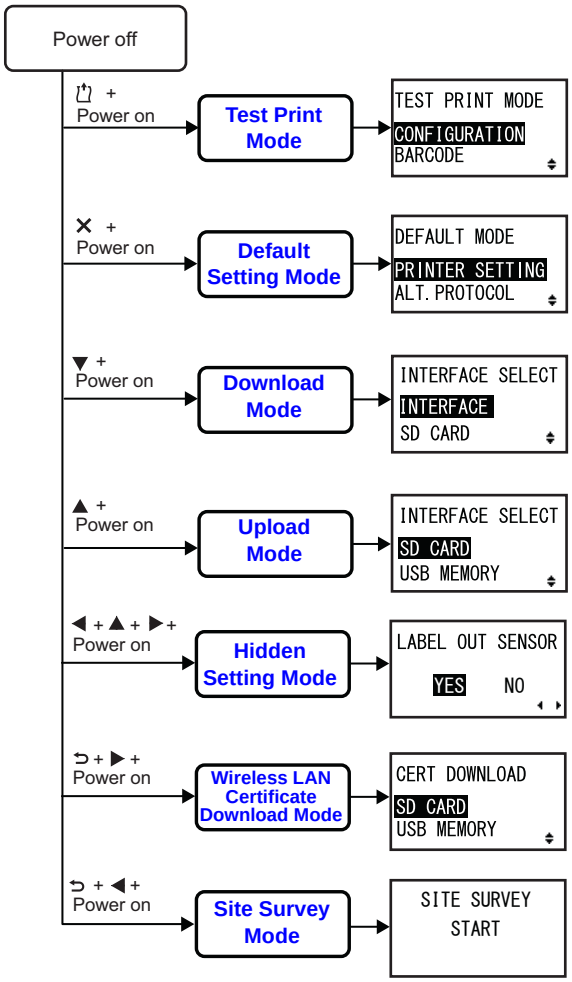
4.2 Operating Modes

The printer contains a variety of the following operating modes:
Click on the blue links below to go directly to the details of the selected operating mode.

- **Online Mode/Pause Mode/Offline Mode**
- **Adjusting the Display Brightness**
- **Adjusting the Buzzer Volume**
- **Canceling the Print Job**
- **Adjustment Mode**
- **Work Shift Setting Mode**
- **Simple Standalone Mode**
- **Setting Mode Menu**:
  - **User Mode**
  - **Interface Mode**
  - **Memory Mode**
  - **Service Mode**
  - **Advanced Mode**
  - **Hex Dump Mode**
  - **RFID User Mode**
  - **Information Mode**
- **Test Print Mode**
- **Default Setting Mode**
- **Download Mode**
- **Upload Mode**
- **Hidden Setting Mode**
- **Wireless LAN Certificate Download Mode**
- **Site Survey Mode**

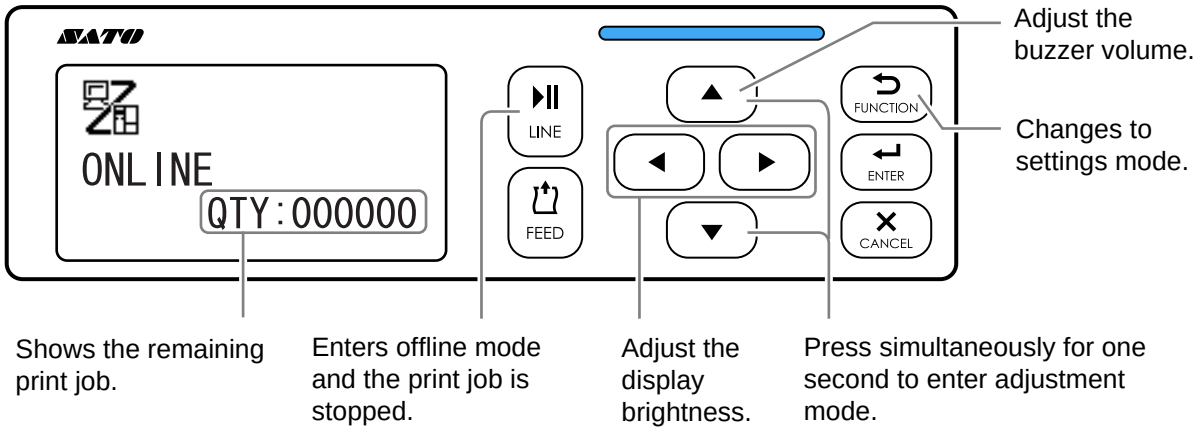
The flow chart provides a clear summary of all the modes and their access methods.



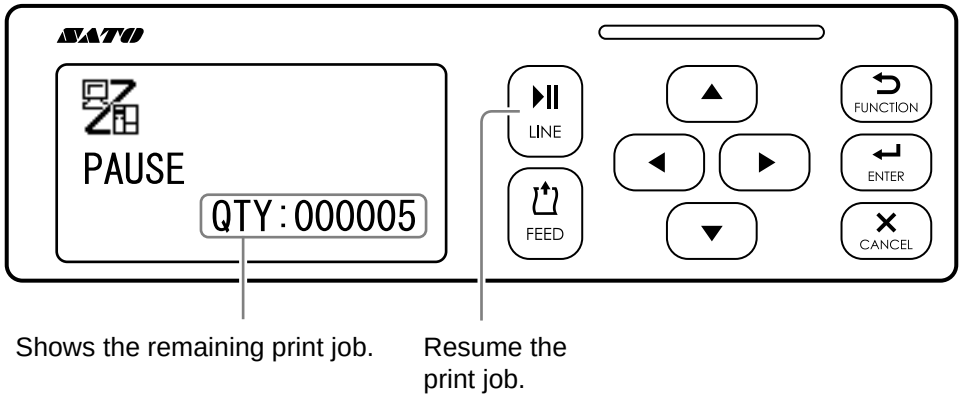

Power off
+
Power on
Test Print Mode
TEST PRINT MODE
CONFIGURATION
BARCODE
+
Power on
Default Setting Mode
DEFAULT MODE
PRINTER SETTING
ALT. PROTOCOL
+
Power on
Download Mode
INTERFACE SELECT
INTERFACE
SD CARD
+
Power on
Upload Mode
INTERFACE SELECT
SD CARD
USB MEMORY
+ + +
Power on
Hidden Setting Mode
LABEL OUT SENSOR
YES
NO
+ +
Power on
Wireless LAN Certificate Download Mode
CERT DOWNLOAD
SD CARD
USB MEMORY
+ +
Power on
Site Survey Mode
SITE SURVEY
START

4.2.1 Online Mode/Pause Mode/Offline Mode

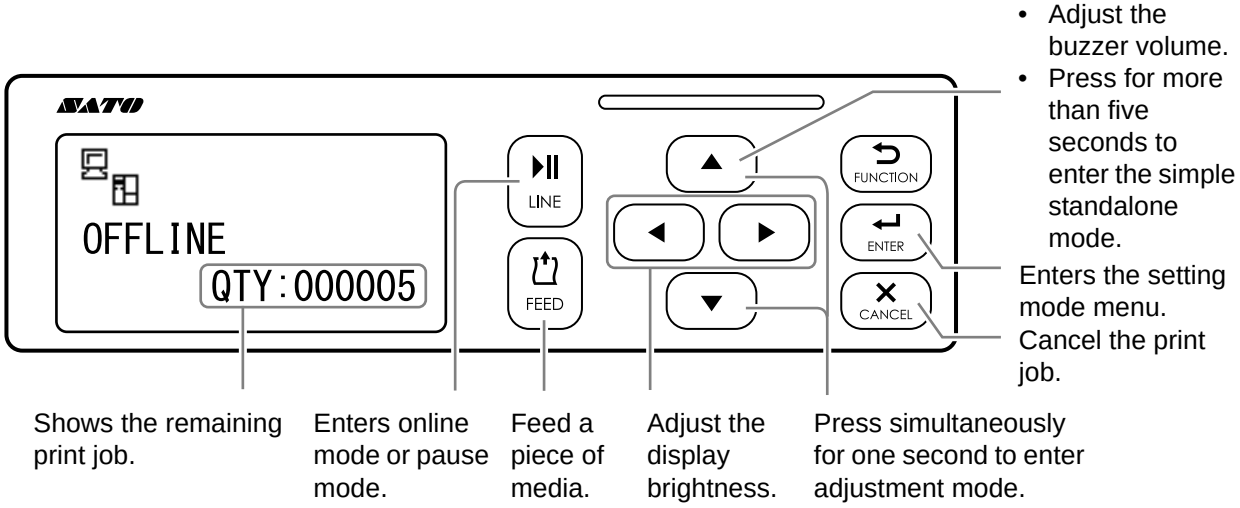
In online mode, the printer is ready to receive print data from the host computer or other connected devices and start the print job.



When you send a pause command during printing, the printer stops the print job and enters pause mode.



In offline mode, you can cancel the print job, feed the media or enter the setting mode menu.



4.2.2 Adjusting the Display Brightness

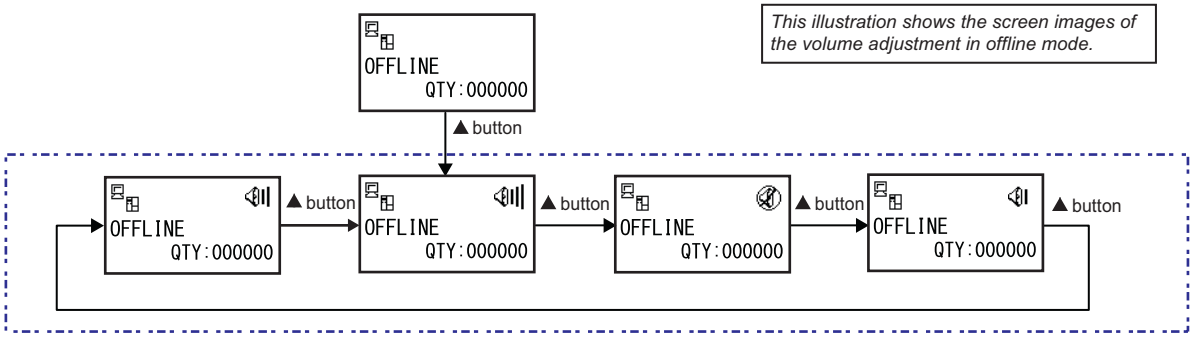
In normal mode (online or offline), press the ◀/▶ buttons repeatedly to adjust the display brightness.



You can adjust the brightness in thirty-two steps (sixteen left and sixteen right).
The brightness changes one step for every press of the ◀ button or ▶ button.

4.2.3 Adjusting the Buzzer Volume

In normal mode (online or offline), press the ▲ button repeatedly to adjust the volume of the buzzer.



1 When the printer is in online or offline mode, press the ▲ button to show the current buzzer volume of the printer.

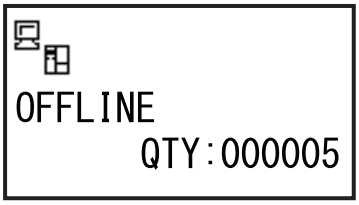
The buzzer volume icon is shown on the top right corner of the screen.

2 Pressing the ▲ button will cycle through the volume level and the buzzer will beep according to the volume.

4.2.4 Canceling the Print Job

Cancel the print job according to the following procedure:

1 Press the ⏯ **LINE** button to change the printer to offline mode.

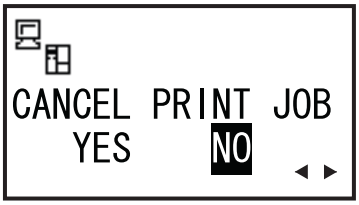


2 Press the ✕ **CANCEL** button.

CANCEL PRINT JOB shows to confirm the cancelation of the print job.

3 Press the ◀/▶ buttons to select YES and press the ↵ **ENTER** button to confirm.

CURRENT and ALL show on the screen.



Note

- Be sure you want to cancel the print job before selecting YES. The job cannot be recovered and it has to be transmitted to the printer again.
- Press the ⮌ **FUNCTION** button or ✕ **CANCEL** button to exit the CANCEL PRINT JOB mode without clearing the print data.

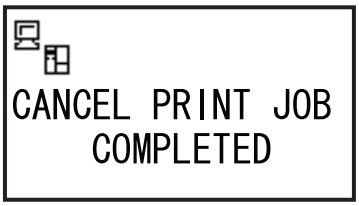
4 Press the ◀/▶ buttons to select CURRENT or ALL.

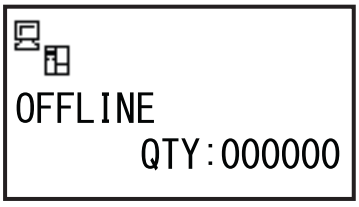
- CURRENT: Cancel the current print job.
- ALL: Cancel all the print jobs in printer's memory.



5 Press the ↵ **ENTER** button to confirm.

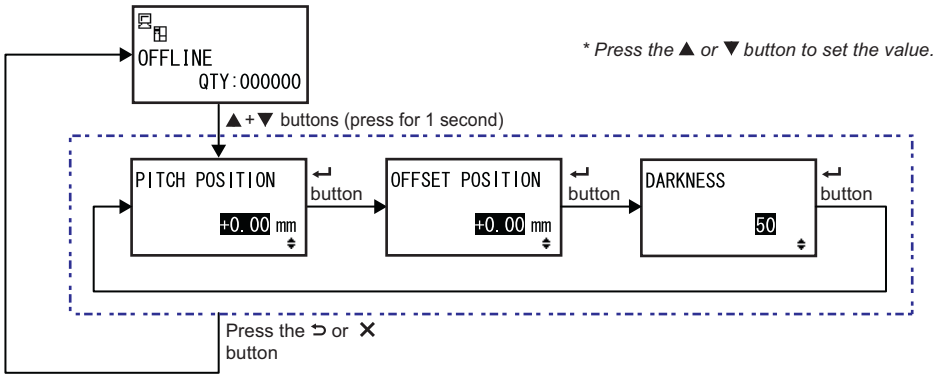
CANCEL PRINT JOB COMPLETED shows and three beeps will sound. The printer will then enter offline mode. The selected print jobs will be cleared from memory.





4.2.5 Adjustment Mode

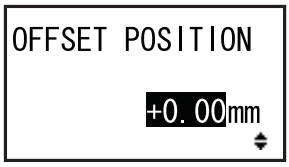
The printer has a quick access to the adjustment mode for setting the print position, stop position and print darkness. These adjustments are in conjunction with the configuration adjustments performed in the user mode menu.



1 When the printer is in online or offline mode, press the ▲ and ▼ buttons for one second to enter the adjustment mode. PITCH POSITION shows on the screen.

2 Press the ▲/▼ buttons to set the desired value and press the ↵ **ENTER** button to save the setting and proceed to the next adjustment screen.

PITCH POSITION	
Offset the print position in the vertical direction. Set the offset value with '+' to move the print position opposite the feed direction and value with '-' to move the print position in the feed direction. The setting value is adjustable by 0.25 mm (0.01”) regardless of the print resolution. The setting range is from -3.75 mm (-0.15”) to +3.75 mm (+0.15”).	

OFFSET POSITON	
Correct the offset position. Offset position refers to the dispense stop position. Set the offset value with '+' to move the stop position opposite the feed direction and value with '-' to move the stop position in the feed direction. The setting value is adjustable by 0.25 mm (0.01”) regardless of the print resolution. The setting range is from -3.75 mm (-0.15”) to +3.75 mm (+0.15”).	

DARKNESS	
Fine tune the print darkness. The setting range is from 00 to 99. 00 is the lightest and 99 is the darkest.	

3 After adjustment, press the ⮌ **FUNCTION** button or ✕ **CANCEL** button to exit the adjustment mode. The printer enters offline mode.

Note

Pressing the ⮌ **FUNCTION** button or ✕ **CANCEL** button before pressing the ↵ **ENTER** button will not save the adjustment.

4 Perform a test print after completing the adjustments to make sure that the settings are correct.

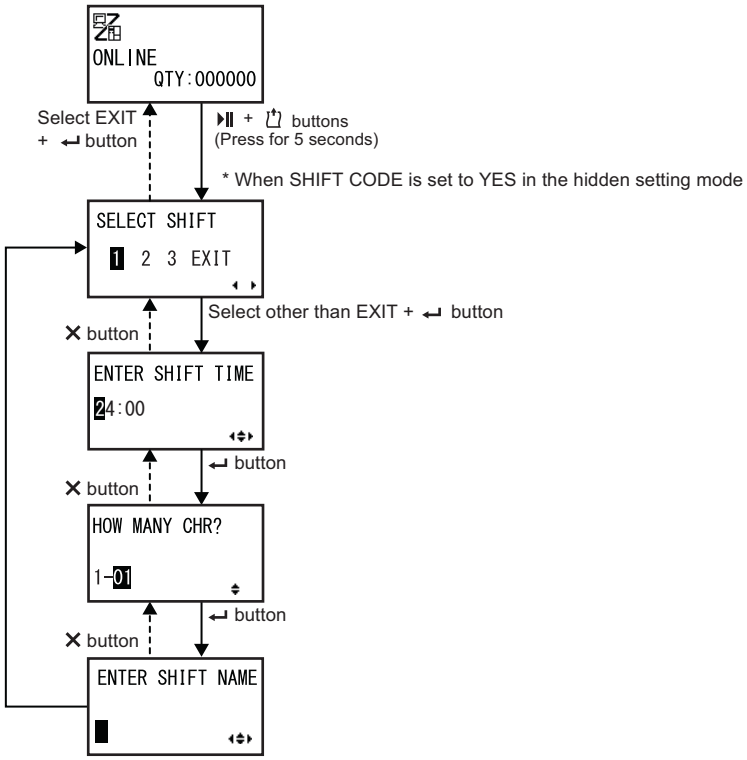
Refer to **Section 4.2.17 Test Print Mode** for details.

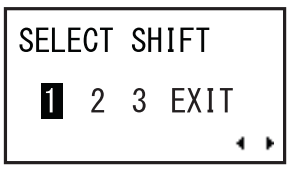
4.2.6 Work Shift Setting Mode

This mode allows for specific production shift information to be printed on a label when used with the printer SBPL command.
The flowchart shows the sequence of the setting screens for the work shift mode. The table describes each setting screen in detail.

Note

- This mode is enabled only if SHIFT CODE is set to YES in the hidden setting mode.
- You can set up to three shifts depending on the number of work shifts required in the field. For example, if two shifts are required, set work shift number 1 and 2.



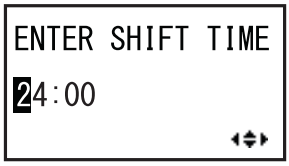
SELECT SHIFT	
Select the work shift number to store the work shift setting. You can select the work shift number from 1 to 3. **Note** If you select EXIT and press the ↵ **ENTER** button, the printer returns to the online screen.	

ENTER SHIFT TIME

Set the printer start time in 24-hour format.

Press the ◀ / ▶ buttons to shift the cursor and press the ▲ / ▼ buttons to change the value.

Press the ↵ **ENTER** button to save the value and proceed to the next setting screen.

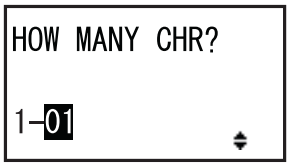


HOW MANY CHR?

Set the character size of the SHIFT NAME by specifying the number of characters.

Select the number of characters using the ▲ / ▼ buttons and then press the ↵ **ENTER** button.

The setting range is from 01 to 16.

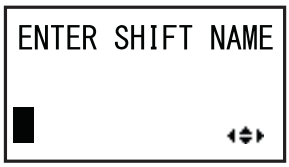


ENTER SHIFT NAME

Specify a name for the work shift.
Available characters are A to Z, space and 0 to 9.
The number of characters you can enter depends on the character size set in the HOW MANY CHR? screen.

Press the ◀ / ▶ buttons to shift the cursor and press the ▲ / ▼ buttons to set the character.

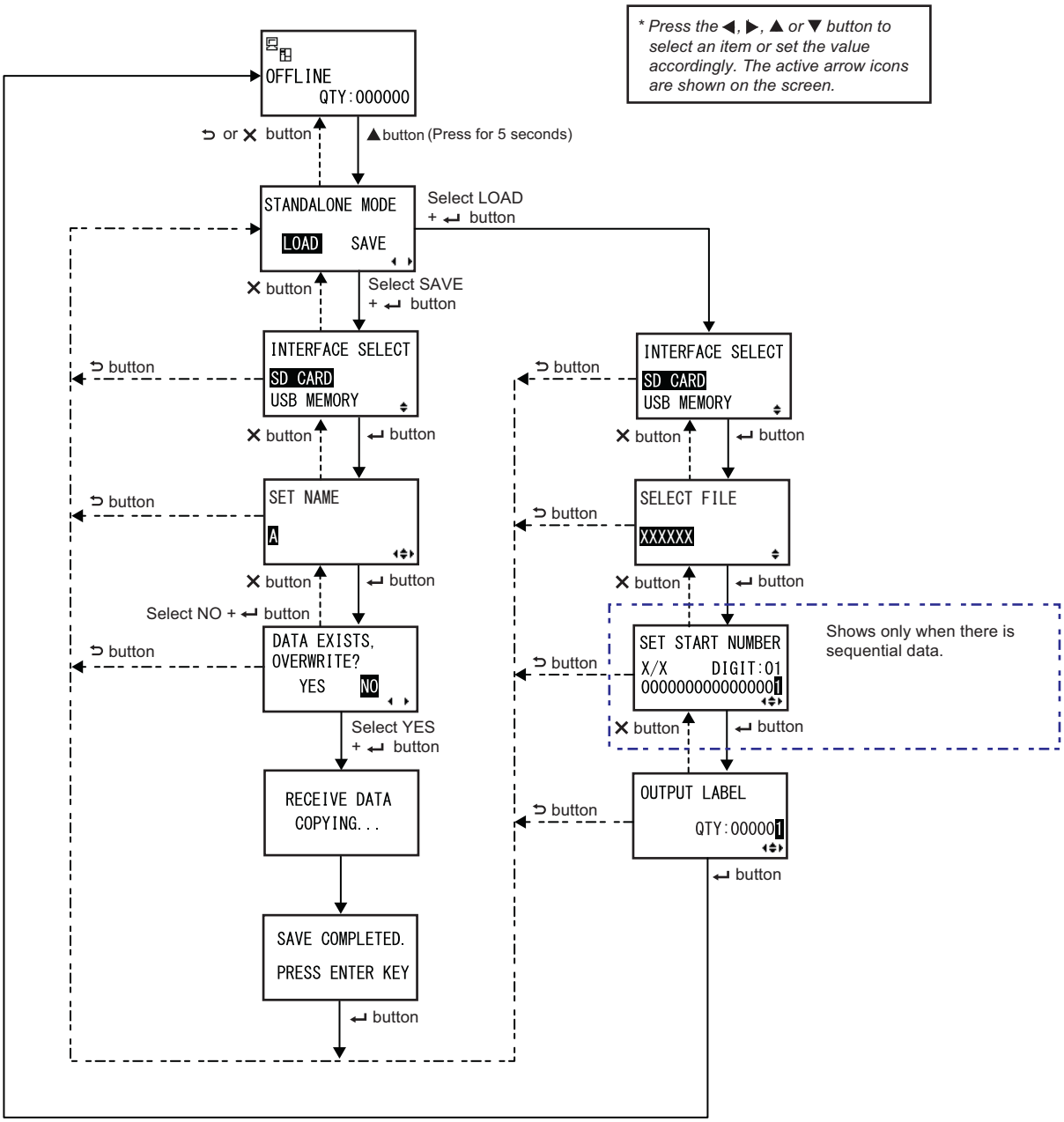
Press the ↵ **ENTER** button to save the work shift name.



4.2.7 Simple Standalone Mode

This mode allows the printer to function independently from a host computer once a fixed format has been sent and saved to the SD card or USB memory.
The data may be saved to the SD card or USB memory while in the print buffer, then recalled later with a new print quantity specified. The SD card or USB memory can hold a maximum of ninety nine formats. However, one file number will only hold a single format; new format will overwrite the existing saved format. The host computer must be reconnected to the printer to overwrite an existing format.

The flowchart shows the sequence of the setting screens for the simple standalone mode. The table describes each setting screen in detail.



⚠ CAUTION

Be sure to perform a virus check for the USB memory or SD card before connecting it to the printer. SATO Corporation shall not be held responsible for a malfunction of the printer caused by a virus infection through the USB memory or SD card.

Note

It is also possible to register, recall and print a SBPL command file that is prepared in advance, as a simple standalone data, and save it to the SD card or USB memory.
Prepare the data according to the followings:

- There should be no command errors in the SBPL command.
- The file name should be equal or less than 16 characters, and the extension should be “SSA”. Refer to below descriptions on **SET NAME** screen for usable characters.
- The data should be saved to “(SD card/USB memory route)\PR61\DATA” folder.

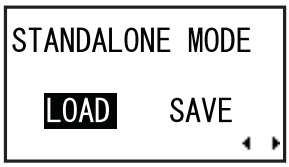
STANDALONE MODE

Select the following options using the ◀/▶ buttons and then press the ↵ **ENTER** button.

- **LOAD**: Read and print the file.
- **SAVE**: Save the received print data to a file.

Note

Three beeps will sound if you select SAVE and press the ↵ **ENTER** button when there is no received data.



INTERFACE SELECT

Select the memory type using the ▲/▼ buttons and then press the ↵ **ENTER** button.

Note

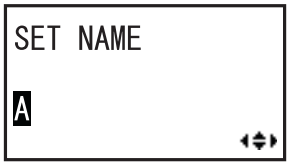
- When LOAD is selected in previous screen, three beeps will sound if the connected memory has no data to load, or the selected memory is not connected.
- When SAVE is selected in previous screen, three beeps will sound if the number of registered items is 99, or the selected memory is not connected.



SET NAME

Specify a name for the received print data.
Available characters are A to Z, a to z, 0 to 9 and !#$%&'()+-,.;=@[]^_`{}~.
When <space> is entered, the characters after the <space> become invalid.
Up to 16 characters can be entered, and the default value is “A”.

Press the ◀/▶ buttons to shift the cursor and press the ▲/▼ buttons to set the character. Then press the ↵ **ENTER** button to save the file name.



DATA EXISTS, OVERWRITE?

This screen confirms that you are overwriting a file if you have selected to save to an existing file name.

Select the following options using the ◀/▶ buttons and then press the ↵ **ENTER** button.

- **YES**: Overwrite the existing file.
- **NO**: Cancel the overwrite and return to the SET NAME screen.

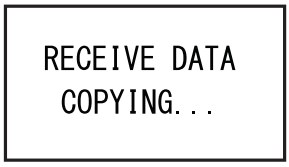
Note
Make sure that you do not need the existing file before overwriting it.



RECEIVE DATA COPYING. . .

This screen shows that the received data is being copied.
SAVE COMPLETED shows when the received data is fully copied.

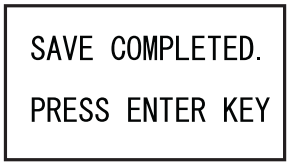
Note
Three beeps will sound if the printer fails to copy the received data. The printer returns to the STANDALONE MODE screen.



SAVE COMPLETED.

This screen shows when the received data is saved to a specified file.

Press the ↵ **ENTER** button to return to the STANDALONE MODE screen.



SELECT FILE

Select the file name of the print data using the ▲/▼ buttons and then press the ↵ **ENTER** button.
The “XXXXXX” in the screen shows the file name of the print data.
Only existing file names in the selected interface are displayed.

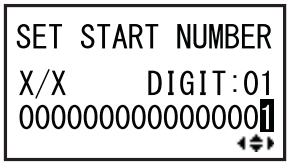
When sequential data are included in the file, the printer goes to the SET START NUMBER screen.
When sequential data are not included in the file, the printer goes to the OUTPUT LABEL screen.



SET START NUMBER

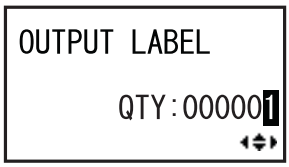
This is the edit screen of the sequential data included in the read data.
Move the cursor using the ◀/▶ buttons, change the value using the ▲/▼ buttons and then press the ↵ **ENTER** button.
The “X/X” in the screen shows the currently edited sequential data number and total sequential data number.
DIGIT is the digit number of the selected cursor.
The screen may be decimal or hexadecimal according to the read data.
The maximum number of DIGIT is 99.

Note
Shows only when there is sequential data.



OUTPUT LABEL

This screen allows you to specify the print number.
Move the cursor using the ◀/▶ buttons, change the value using the ▲/▼ buttons and then press the ↵ **ENTER** button.



4.2.8 Setting Mode Menu

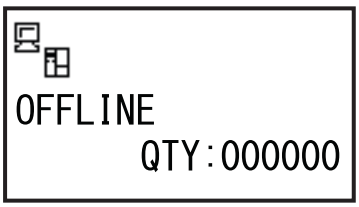
In the settings mode menu, the setting modes are shown as follows:

Menu	Description
Online mode	Returns to online mode.
User mode	Access the settings related to the basic user configurations.
Interface mode	Access the settings related to the interfaces.
Memory mode	Access the settings related to the memory.
Service mode	Access the settings related to the media sensor adjustment and various functions activation.
Advanced mode	Access the settings related to the advanced printer configurations.
Hex dump mode	Access and print the hex dump for troubleshooting.
RFID user mode	Access the settings related to the optional RFID module. Shows only if you have installed the optional RFID kit and enabled the RFID mode.
Information mode	Access the information of this printer.

Select the setting mode according to the following procedure:

1 Press the ⏯ **LINE** button to change the printer to offline mode.

The printer changes to offline mode.



2 Press the ↵ **ENTER** button.

The printer changes to the setting mode menu.

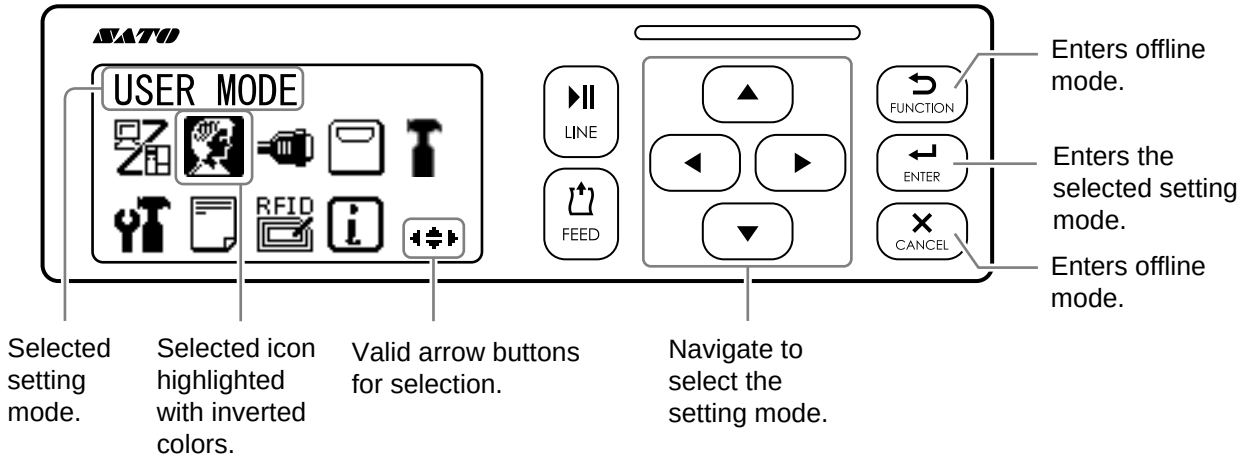
3 Select the setting mode using the ▲/▼/◀/▶ buttons.

The selected setting mode shows on the screen and the icon is highlighted by inverting its colors.



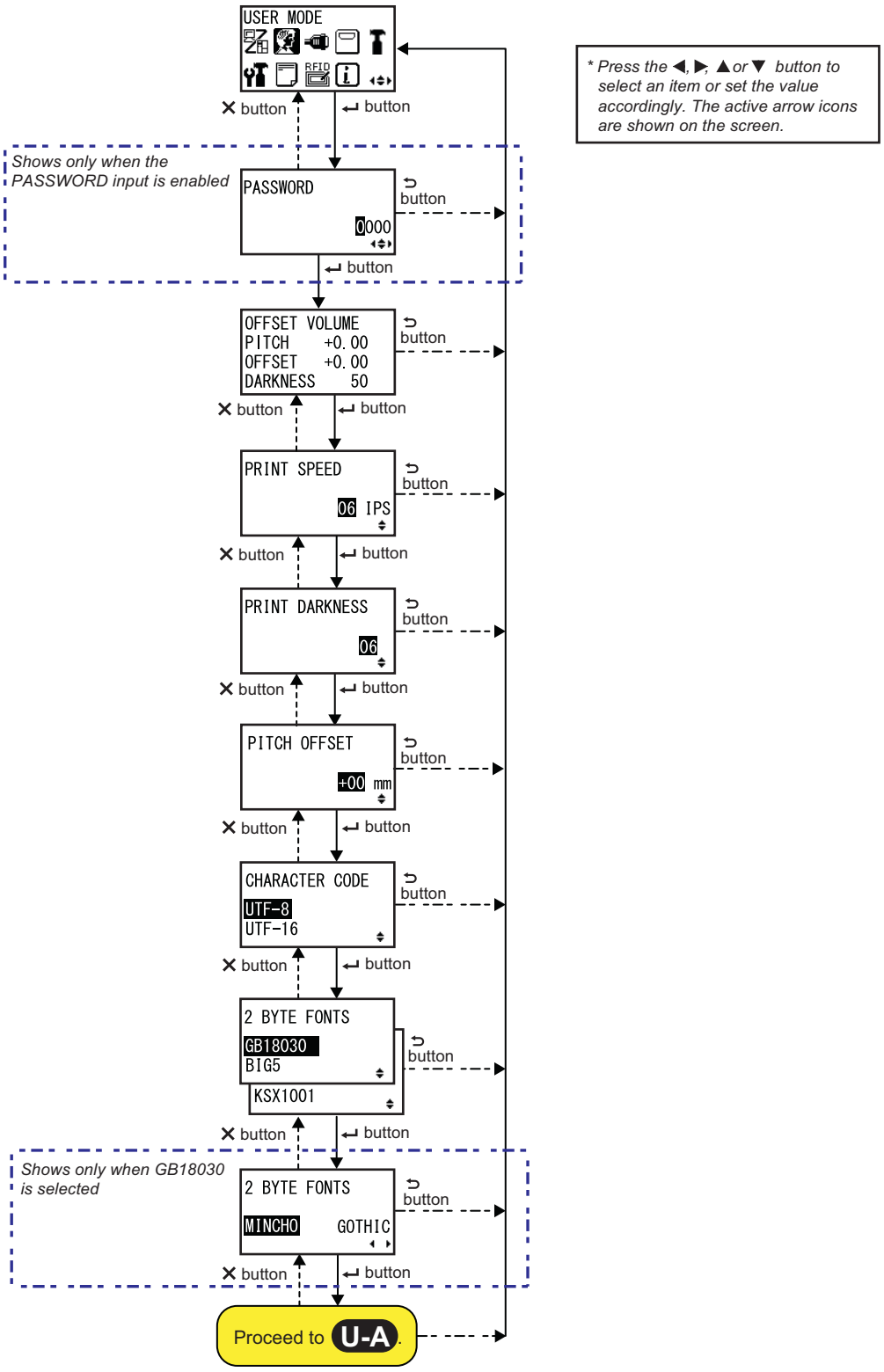
4 Press the ↵ **ENTER** button to enter the selected mode.

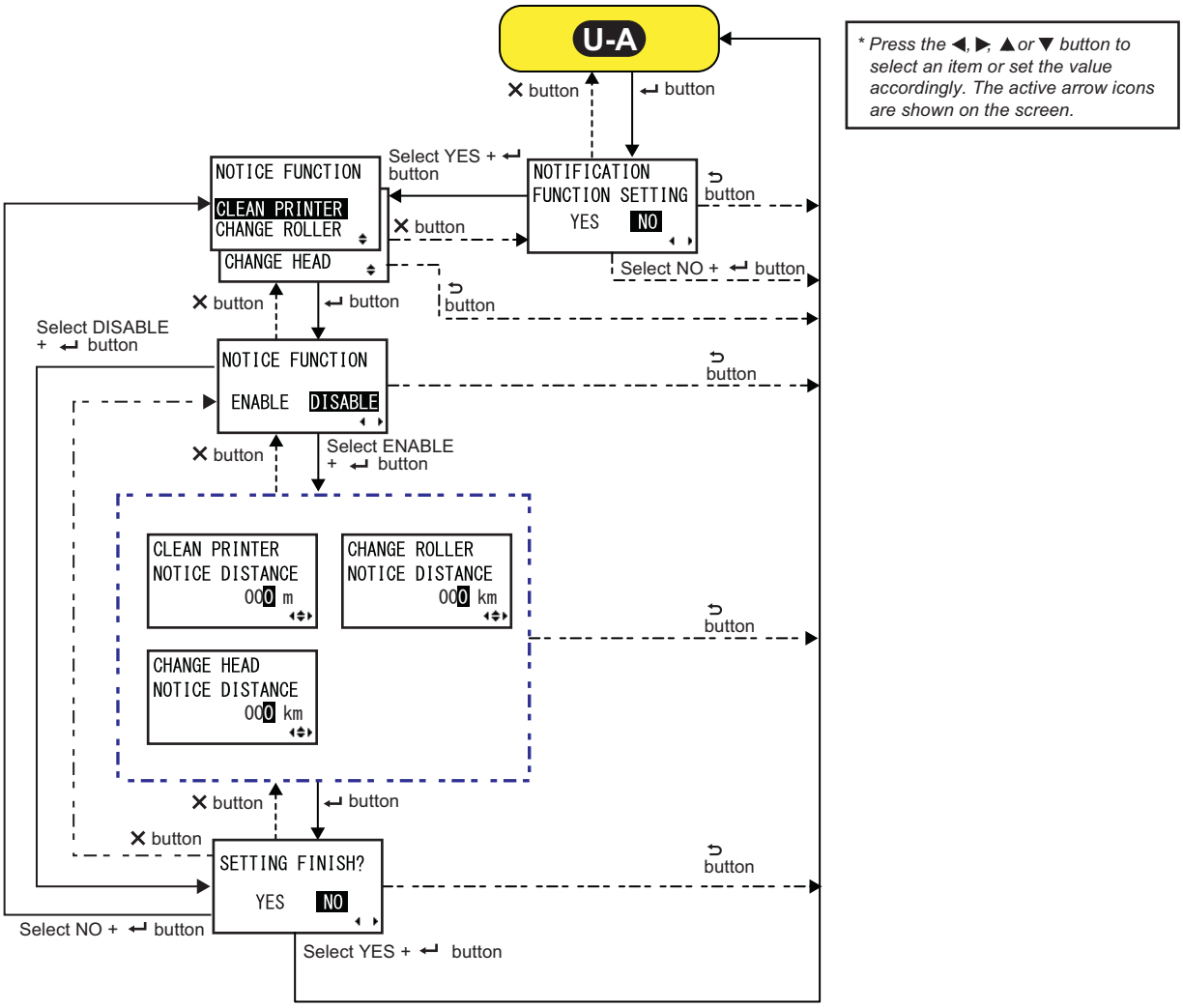
The functions of the buttons in the setting mode menu are shown as below.



4.2.9 User Mode

The flowchart shows the sequence of the setting screens for the user mode. The table describes each setting screen in detail.





OFFSET VOLUME

The setting values of the adjustment mode are shown.

- **PITCH**: Shows the print position offset value.
- **OFFSET**: Shows the stop position offset value.
- **DARKNESS**: Shows the darkness setting value.

You can change these values in **Adjustment Mode** and **Test Print Mode**.

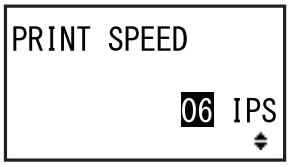
```
OFFSET VOLUME
PITCH     +0.00
OFFSET    +0.00
DARKNESS     50
```

PRINT SPEED

The setting range varies depending on the model.

- S84-ex (203 dpi): 4 to 16 ips (inches/sec)
- S86-ex (203 dpi): 4 to 14 ips (inches/sec)
- S84-ex (305 dpi): 4 to 14 ips (inches/sec)
- S86-ex (305 dpi): 4 to 12 ips (inches/sec)
- S84-ex (609 dpi): 2 to 6 ips (inches/sec)

Note
Setting the print speed to a level that is too fast may affect the print quality.



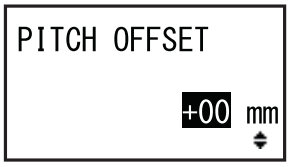
PRINT DARKNESS

Specify the print darkness from ten steps.
The setting range is from 1 to 10. 1 is the lightest and 10 is the darkest.



PITCH OFFSET

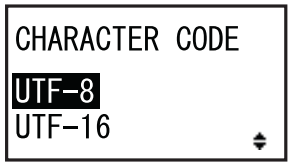
This setting adjusts the pitch offset value.
The media pitch is the distance between the leading edge (the edge that comes out of the printer first) of the media and the leading edge of the next media. Once the position has been set, it can be fine adjusted using the PITCH POSITION in adjustment mode.
The setting range is from -49 mm (-1.9”) to +49 mm (+1.9”) and is adjustable by 1 mm (0.04”) steps.
Set the offset value with '+' to move the print position opposite the feed direction and value with '-' to move the print position in the feed direction.



CHARACTER CODE

Set the character code to be used.

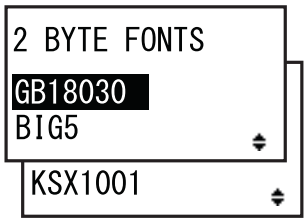
- **UTF-8**: Use UTF-8 for character encoding.
- **UTF-16**: Use UTF-16 for character encoding.



2 BYTE FONTS

Set the kanji code to be used.

- **GB18030**: Set for use with simplified Chinese.
- **BIG5**: Set for use with traditional Chinese.
- **KSX1001**: Set for use with Korean.



The following kanji codes are available if GB18030 is selected:

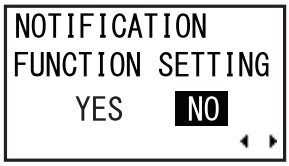
- **MINCHO**: Print the kanji code using MINCHO.
- **GOTHIC**: Print the kanji code using GOTHIC.



NOTIFICATION FUNCTION SETTING

Select whether or not to set the notification function.

- **YES**: Set the notification function.
- **NO**: Do not set the notification function. The screen returns to user mode.

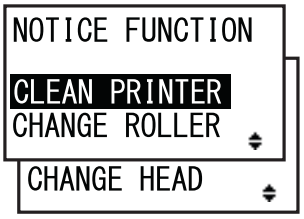


Note
For details on the media motion when the set notification interval has reached, refer to **Section 8.6 Notification Function**.

NOTICE FUNCTION (SELECT)

Select the items for notification.

- **CLEAN PRINTER**: Notify when to perform cleaning of the printer.
- **CHANGE ROLLER**: Notify when to perform replacement of the platen roller.
- **CHANGE HEAD**: Notify when to perform replacement of the print head.



NOTICE FUNCTION (ENABLE/DISABLE)

Enable or disable the notification for the item selected in the above NOTICE FUNCTION.

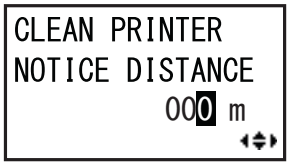
- **ENABLE**: Enable the notification function.
- **DISABLE**: Disable the notification function.



CLEAN PRINTER

Set the notification distance for cleaning the printer.
The setting range is from 000 to 999 m.

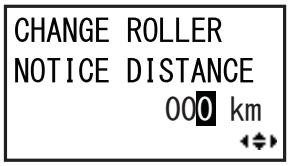
Note
The notification function will be disabled if the distance is set to 0.



CHANGE ROLLER

Set the notification distance for changing the platen roller.
The setting range is from 000 to 150 km.

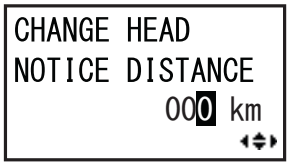
Note
The notification function will be disabled if the distance is set to 0.



CHANGE HEAD

Set the notification distance for changing the print head.
The setting range is from 000 to 150 km.

Note
The notification function will be disabled if the distance is set to 0.



SETTING FINISH?

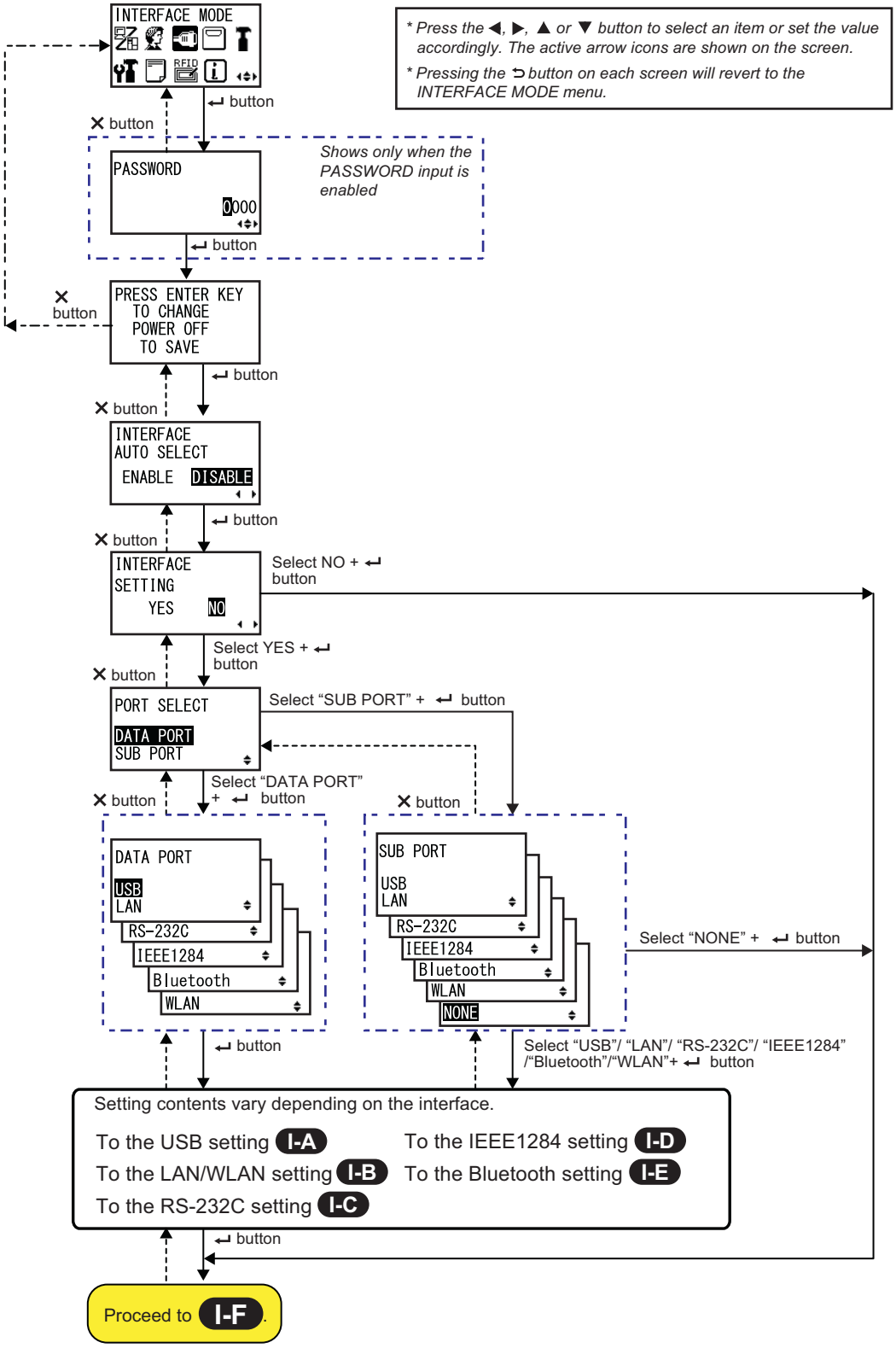
Confirm to complete the setting.

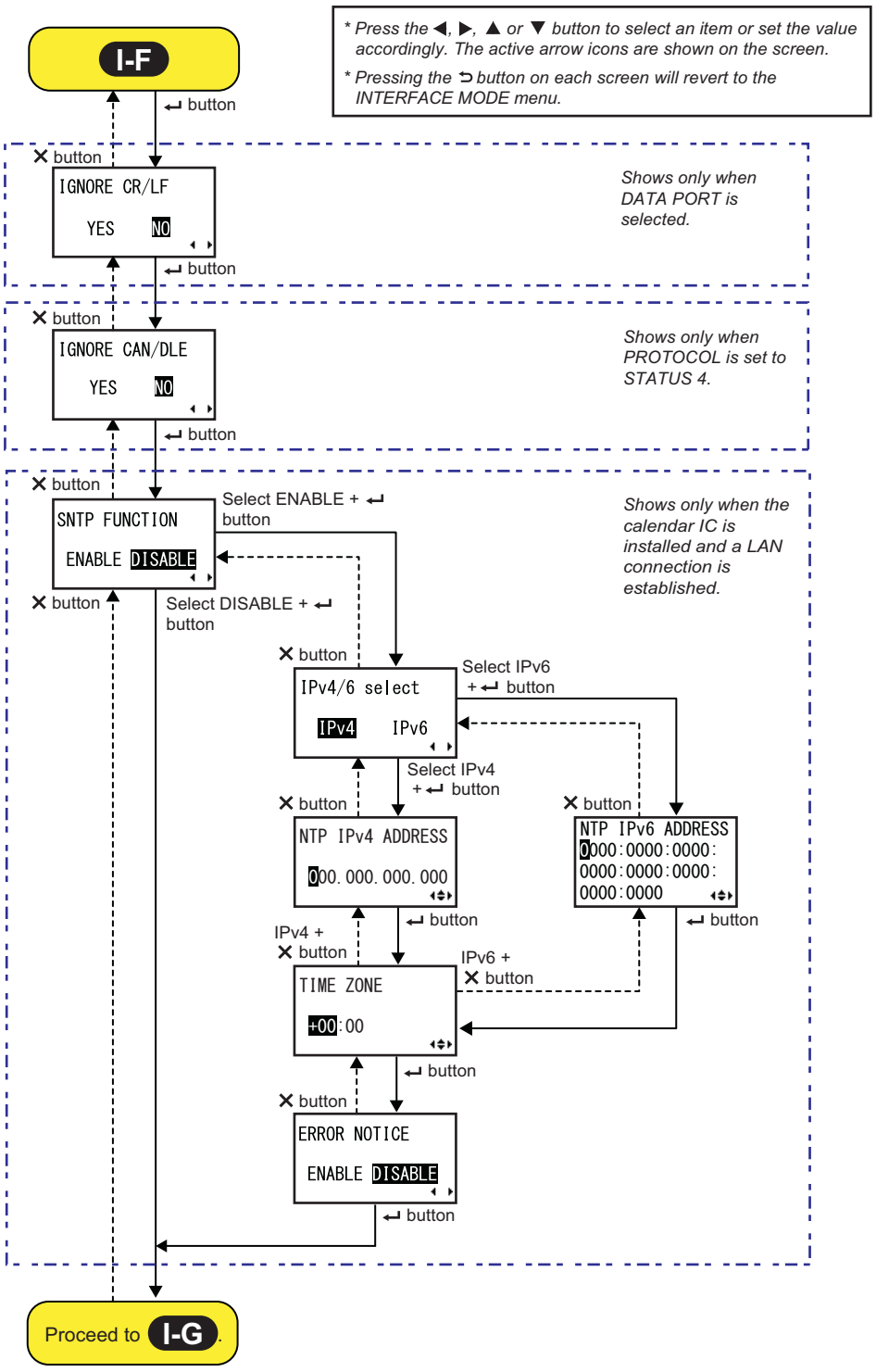
- **YES**: Returns to the user mode screen.
- **NO**: Returns to the NOTICE FUNCTION screen to select an item.

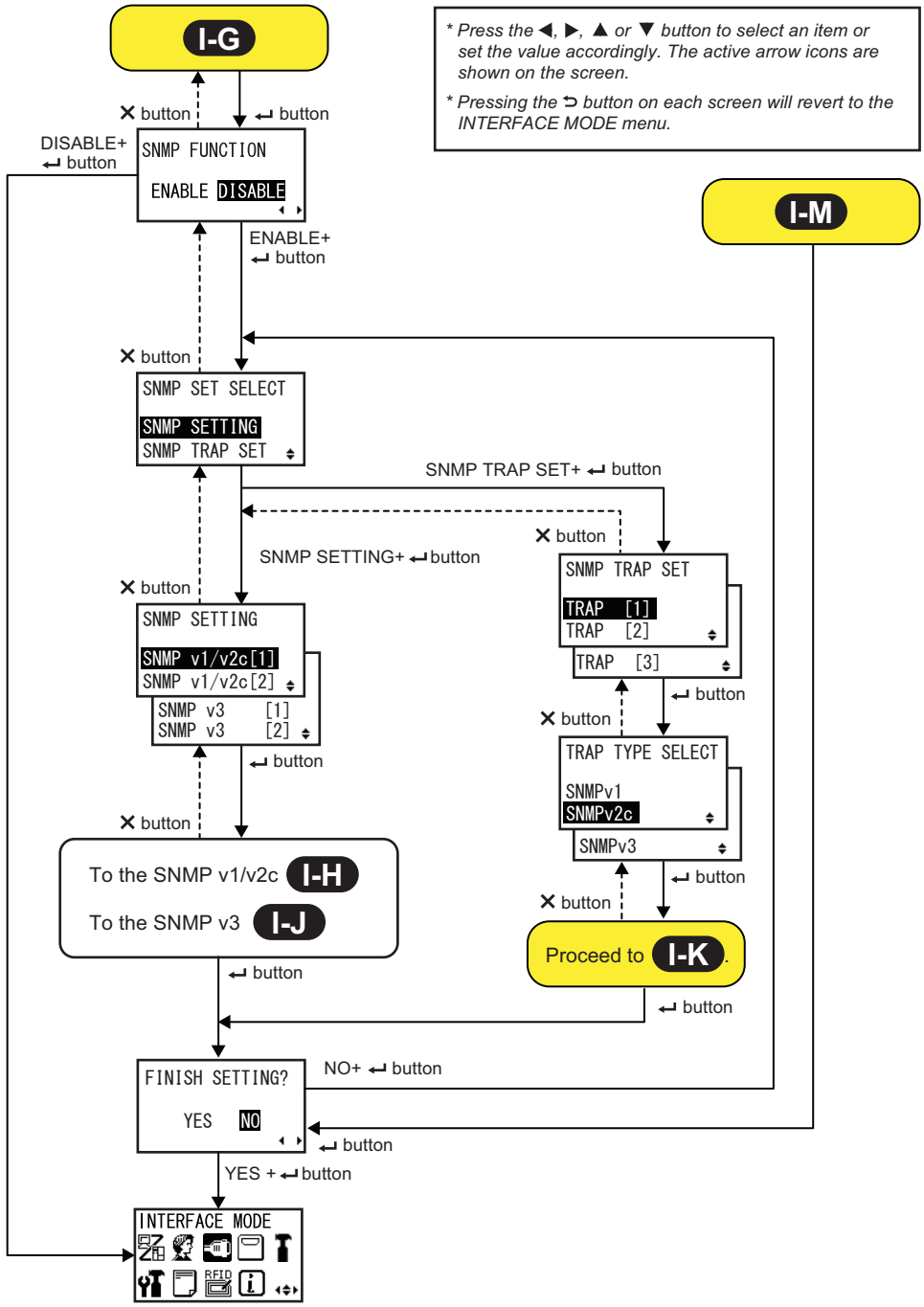


4.2.10 Interface Mode

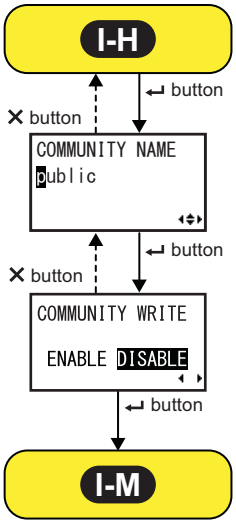
The flowchart shows the sequence of the setting screens for the interface mode. The table describes each setting screen in detail.

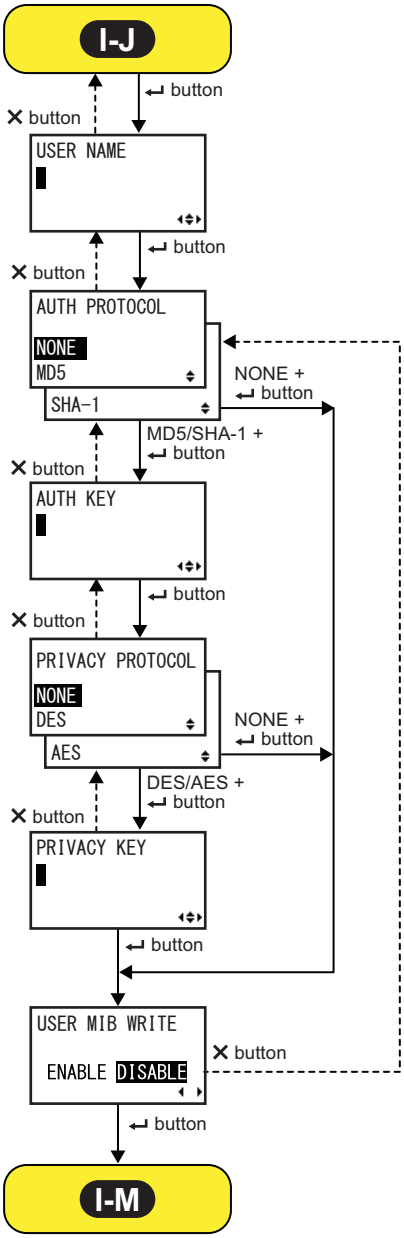


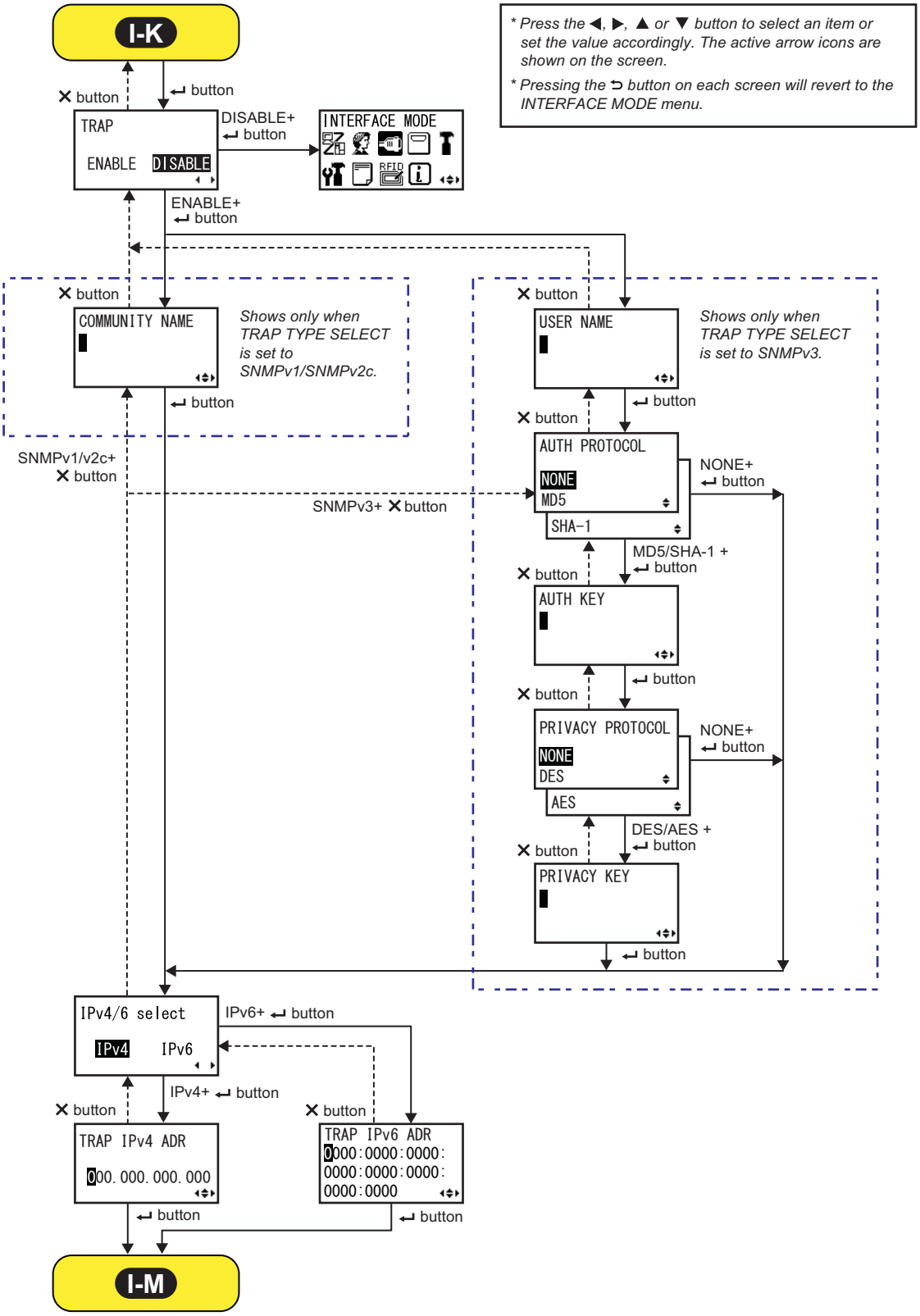

* Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
* Pressing the ⮌ button on each screen will revert to the INTERFACE MODE menu.
I-F
↵ button
✕ button
IGNORE CR/LF
YES NO
Shows only when DATA PORT is selected.
IGNORE CAN/DLE
YES NO
Shows only when PROTOCOL is set to STATUS 4.
SNTP FUNCTION
ENABLE DISABLE
Select ENABLE + ↵ button
Select DISABLE + ↵ button
Shows only when the calendar IC is installed and a LAN connection is established.
IPv4/6 select
IPv4 IPv6
Select IPv6 + ↵ button
Select IPv4 + ↵ button
NTP IPv4 ADDRESS
000.000.000.000
NTP IPv6 ADDRESS
0000:0000:0000:
0000:0000:0000:
0000:0000
IPv4 + ✕ button
IPv6 + ✕ button
TIME ZONE
+00:00
ERROR NOTICE
ENABLE DISABLE
Proceed to I-G


I-G
* Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
* Pressing the ⮌ button on each screen will revert to the INTERFACE MODE menu.
I-M
✕ button
↵ button
DISABLE+ ↵ button
SNMP FUNCTION
ENABLE DISABLE
ENABLE+ ↵ button
SNMP SET SELECT
SNMP SETTING
SNMP TRAP SET
SNMP TRAP SET+ ↵ button
SNMP SETTING+ ↵ button
SNMP SETTING
SNMP v1/v2c[1]
SNMP v1/v2c[2]
SNMP v3 [1]
SNMP v3 [2]
SNMP TRAP SET
TRAP [1]
TRAP [2]
TRAP [3]
TRAP TYPE SELECT
SNMPv1
SNMPv2c
SNMPv3
To the SNMP v1/v2c I-H
To the SNMP v3 I-J
Proceed to I-K.
FINISH SETTING?
YES NO
NO+ ↵ button
YES + ↵ button
INTERFACE MODE

* *Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.*
* *Pressing the ⮌ button on each screen will revert to the INTERFACE MODE menu.*

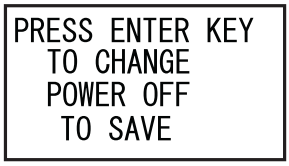





I-K
* Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
* Pressing the ⮌ button on each screen will revert to the INTERFACE MODE menu.
✕ button
↵ button
TRAP
ENABLE DISABLE
DISABLE+ ↵ button
INTERFACE MODE
ENABLE+ ↵ button
COMMUNITY NAME
Shows only when TRAP TYPE SELECT is set to SNMPv1/SNMPv2c.
SNMPv1/v2c+ ✕ button
SNMPv3+ ✕ button
USER NAME
Shows only when TRAP TYPE SELECT is set to SNMPv3.
AUTH PROTOCOL
NONE
MD5
SHA-1
NONE+ ↵ button
MD5/SHA-1 + ↵ button
AUTH KEY
PRIVACY PROTOCOL
NONE
DES
AES
NONE+ ↵ button
DES/AES + ↵ button
PRIVACY KEY
IPv4/6 select
IPv4 IPv6
IPv6+ ↵ button
IPv4+ ↵ button
TRAP IPv4 ADR
000. 000. 000. 000
TRAP IPv6 ADR
0000:0000:0000:
0000:0000:0000:
0000:0000
I-M

PRESS ENTER KEY

This screen reminds the user to press the ↵ **ENTER** button to change or power off the printer to save the setting.



INTERFACE AUTO SELECT

Enable or disable the interface auto detection.

- **ENABLE**: Automatically select the connected interface.
- **DISABLE**: The interface is selected based on the interface setting.

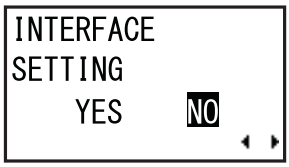
Note
The setting will be effective only if you power on the printer again.



INTERFACE SETTING

Set whether or not to perform the interface settings.

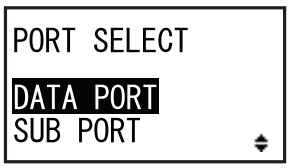
- **YES**: Enter the PORT SELECT screen.
- **NO**: Enter the IGNORE CR/LF screen.



PORT SELECT

Select the port used for the connected interface.

- **DATA PORT:** For receiving various SBPL commands and executing print operations.
- **SUB PORT:** For monitoring the printer status and connecting to external devices.



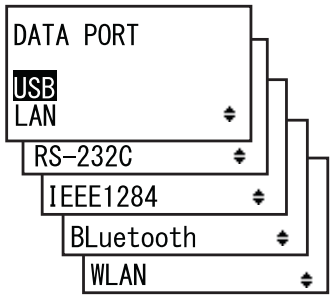
DATA PORT

Select the connected interface for use with the data port.
The options are as follows:

- **USB**
- **LAN**
- **RS-232C**
- **IEEE1284**
- **Bluetooth**
- **WLAN**

Note

- Bluetooth shows even if a Bluetooth adapter is not connected.
- WLAN shows only if a WLAN unit is installed.
- You cannot select the interface that has already been set for the SUB PORT.
- The setting will be effective only if you power on the printer again.



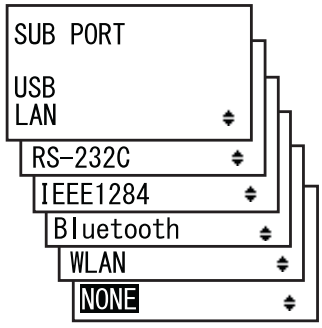
SUB PORT

Select the connected interface for use with the data port.
The options are as follows:

- **USB**
- **LAN**
- **RS-232C**
- **IEEE1284**
- **Bluetooth**
- **WLAN**
- **NONE**

Note

- Bluetooth shows even if a Bluetooth adapter is not connected.
- WLAN shows only if a WLAN unit is installed.
- You cannot select the interface that has already been set for the DATA PORT.
- The setting will be effective only if you power on the printer again.



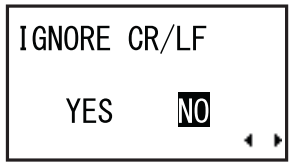
IGNORE CR/LF

Ignore or acknowledge the CR/LF code of the received data.

- **YES**: Ignore the CR/LF code.
- **NO**: Do not ignore the CR/LF code.

Note

Shows only if the DATA PORT is selected.

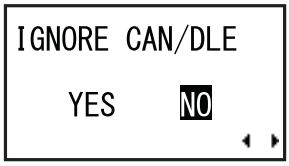


IGNORE CAN/DLE

Ignore or acknowledge the CAN/DLE code of the received data.

- **YES**: Ignore the CAN/DLE code.
- **NO**: Do not ignore the CAN/DLE code.

Note
Shows only if PROTOCOL is set to STATUS4.



SNTP FUNCTION

Enable or disable the SNTP function.

- **ENABLE**: Perform the time correction of the calendar IC.
- **DISABLE**: Do not perform the time correction of the calendar IC.

Note
Shows only if the calendar IC is installed and the LAN interface is selected.

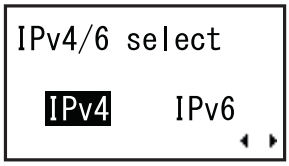


IPv4/6 select

Select IP address type of SNTP.

- **IPv4**
- **IPv6**

Note
Shows only if the SNTP function is enabled.

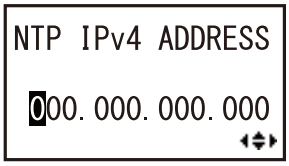


NTP IPv4 ADDRESS

Set the IPv4 address for NTP server.

The setting range is from 0.0.0.0 to 255.255.255.255.

Note
Shows only if the SNTP function is enabled.

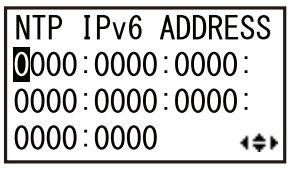


NTP IPv6 ADDRESS

Set the IPv6 address for NTP server.

The setting range is from 0000:0000:0000:0000:0000:0000:0000:0000 to FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF.

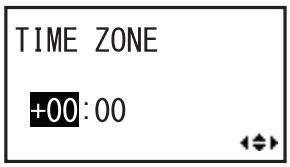
Note
Shows only if the SNTP function is enabled.



TIME ZONE

Set the time zone.
The setting range is from -12:45 to +14:45.

Note
Shows only if the SNTP function is enabled.

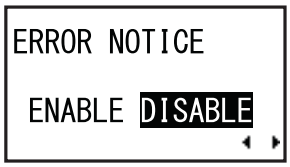


ERROR NOTICE

Set whether or not to notify the SNTP function error.

- **ENABLE**: Shows an error notice when failing to correct the time.
- **DISABLE**: Does not show an error notice when failing to correct the time.

Note
Shows only if the SNTP function is enabled.



SNMP FUNCTION

Set the SNMP function.

- **ENABLE**: Enables the SNMP function and goes to “SNMP setting select” screen.
- **DISABLE**: Disables the SNMP function and goes to “Interface select screen.

Note
Shows only if the LAN interface is selected.



SNMP SET SELECT

Select SNMP settings.

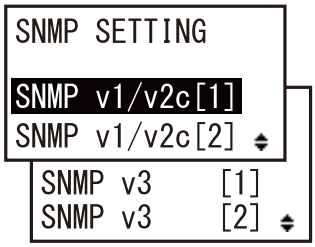
- **SNMP SETTING**: Sets the SNMP settings. When select it, goes to “SNMP setting” screen.
- **SNMP TRAP SET**: Selects the trap number of SNMP. When select it, goes to “SNMP trap setting” screen.



SNMP SETTING

Select community and authentication of SNMP.

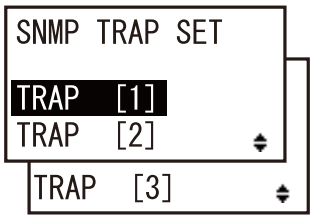
- **SNMPv1/v2c [1]**: Goes to “Community name” screen.
- **SNMPv1/v2c [2]**: Goes to “Community 2 name” screen.
- **SNMPv3 [1]**: Goes to “Authentication 1 user name” screen.
- **SNMPv3 [2]**: Goes to “Authentication 2 user name” screen.



SNMP TRAP SET

Select the trap number of SNMP from 1 to 3.

- **TRAP [1]**
- **TRAP [2]**
- **TRAP [3]**

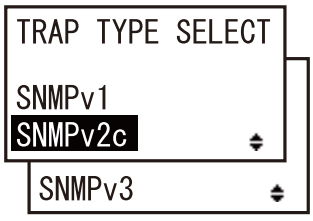


TRAP TYPE SELECT

Select SNMP trap type.

- **SNMPv1**
- **SNMPv2c**
- **SNMPv3**

Note
The setting will be effective only if you power on the printer again.



COMMUNITY NAME

Input SNMP community name.

- When SNMPv1/v2c [1] is selected the default is “public”.
- When SNMPv1/v2c [2] is selected the default is “ ” (none).

Note
- Up to 32 alphanumeric characters and symbols (from 20H to 7EH) can be set.
- Specify “␣” to input a space.
- The setting will be effective only if you power on the printer again.



COMMUNITY WRITE

Enable or disable writing to MIB when accessing to community.

- **ENABLE**: Allows writing to MIB.
- **DISABLE**: Does not allow writing to MIB.

Note
Writing possible OID are sysContact, sysName, and sysLocation.



USER NAME

Input SNMP authentication user name.

Press the ◀/▶ buttons to shift the cursor and press the ▲/▼ buttons to change the value.

Press the ↵ **ENTER** button to save the value and proceed to the next setting screen.

Note
- Up to 32 alphanumeric characters and symbols (from 20H to 7EH) can be set.
- Specify “␣” to input a space.
- The setting will be effective only if you power on the printer again.

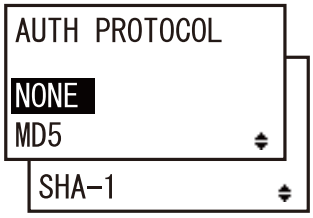


AUTH PROTOCOL

Select SNMP authentication protocol.
The options are as follows:

- **NONE**
- **MD5**
- **SHA-1**

Note
The setting will be effective only if you power on the printer again.



AUTH KEY

Input SNMP authentication key.
Input more than 8 characters for the authentication name.

Press the ◀/▶ buttons to shift the cursor and press the ▲/▼ buttons to change the value.

Press the ↵ **ENTER** button to save the value and proceed to the next setting screen.

Note
- When the authentication name is less than 8 characters, there will be buzzer sounds and it will not move to the next screen.
- Up to 32 alphanumeric characters and symbols (from 20H to 7EH) can be set.
- Specify "␣" to input a space.
- The setting will be effective only if you power on the printer again.

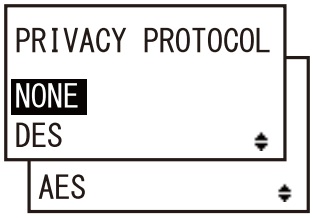


PRIVACY PROTOCOL

Select SNMP privacy protocol.
The options are as follows:

- **NONE**
- **DES**
- **AES**

Note
The setting will be effective only if you power on the printer again.

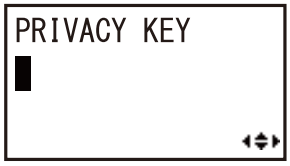


PRIVACY KEY

Input SNMP privacy key.
Input more than 8 characters for the authentication name.

Press the ◀/▶ buttons to shift the cursor and press the ▲/▼ buttons to change the value.

Press the ↵ **ENTER** button to save the value and proceed to the next setting screen.



Note

- When the authentication name is less than 8 characters, there will be buzzer sounds and it will not move to the next screen.
- Up to 32 alphanumeric characters and symbols (from 20H to 7EH) can be set.
- Specify "␣" to input a space.
- The setting will be effective only if you power on the printer again.

USER MIB WRITE

Enable or disable writing to MIB at authentication access.

- **ENABLE**: Allows writing to MIB.
- **DISABLE**: Does not allow writing to MIB.



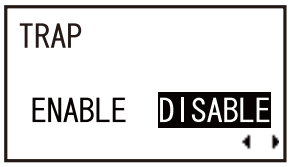
Note

Writing possible OID are sysContact, sysName, and sysLocation.

TRAP

Set the SNMP trap.

- **ENABLE**: Allows the SNMP trap.
- **DISABLE**: Does not allow the SNMP trap.



Note

The setting will be effective only if you power on the printer again.

COMMUNITY NAME

Input SNMP trap community name.

Press the ◀/▶ buttons to shift the cursor and press the ▲/▼ buttons to change the value.

Press the ↵ **ENTER** button to save the value and proceed to the next setting screen.



Note

- When the authentication name is less than 8 characters, there will be buzzer sounds and it will not move to the next screen.
- Up to 32 alphanumeric characters and symbols (from 20H to 7EH) can be set.
- Specify "␣" to input a space.
- The setting will be effective only if you power on the printer again.

USER NAME

Input SNMP trap authentication user name.

Press the ◀/▶ buttons to shift the cursor and press the ▲/▼ buttons to change the value.

Press the ↵ **ENTER** button to save the value and proceed to the next setting screen.



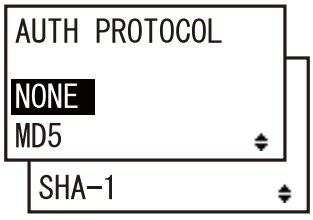
Note

- Up to 32 alphanumeric characters and symbols (from 20H to 7EH) can be set.
- Specify "␣" to input a space.
- The setting will be effective only if you power on the printer again.

AUTH PROTOCOL

Select SNMP trap authentication protocol.
The options are as follows:

- **NONE**
- **MD5**
- **SHA-1**



Note

The setting will be effective only if you power on the printer again.

AUTH KEY

Input SNMP trap authentication key.
Input more than 8 characters for the authentication name.

Press the ◀/▶ buttons to shift the cursor and press the ▲/▼ buttons to change the value.

Press the ↵ **ENTER** button to save the value and proceed to the next setting screen.



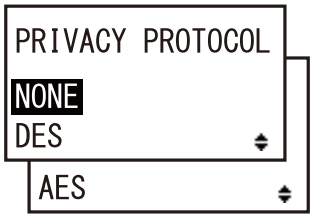
Note

- When the authentication name is less than 8 characters, there will be buzzer sounds and it will not move to the next screen.
- Up to 32 alphanumeric characters and symbols (from 20H to 7EH) can be set.
- Specify "␣" to input a space.
- The setting will be effective only if you power on the printer again.

PRIVACY PROTOCOL

Select SNMP trap privacy protocol.
The options are as follows:

- **NONE**
- **DES**
- **AES**



Note

The setting will be effective only if you power on the printer again.

PRIVACY KEY

Input SNMP trap privacy key.
Input more than 8 characters for the authentication name.

Press the ◀/▶ buttons to shift the cursor and press the ▲/▼ buttons to change the value.

Press the ↵ **ENTER** button to save the value and proceed to the next setting screen.



Note

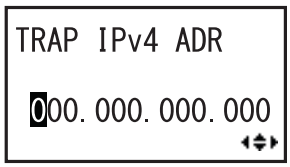
- When the authentication name is less than 8 characters, there will be buzzer sounds and it will not move to the next screen.
- Up to 32 alphanumeric characters and symbols (from 20H to 7EH) can be set.
- Specify "␣" to input a space.
- The setting will be effective only if you power on the printer again.

TRAP IPv4 ADR

Set the IPv4 address where trap is output.

The setting range is from 0.0.0.0 to 255.255.255.255.

Note
Shows only if the SNTP function is enabled.

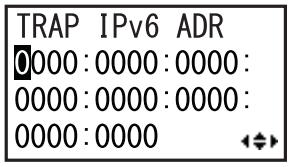


TRAP IPv6 ADR

Set the IPv6 address where trap is output.

The setting range is from 0000:0000:0000:0000:0000:0000:0000:0000 to FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF.

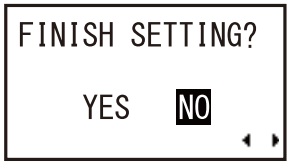
Note
Shows only if the SNTP function is enabled.



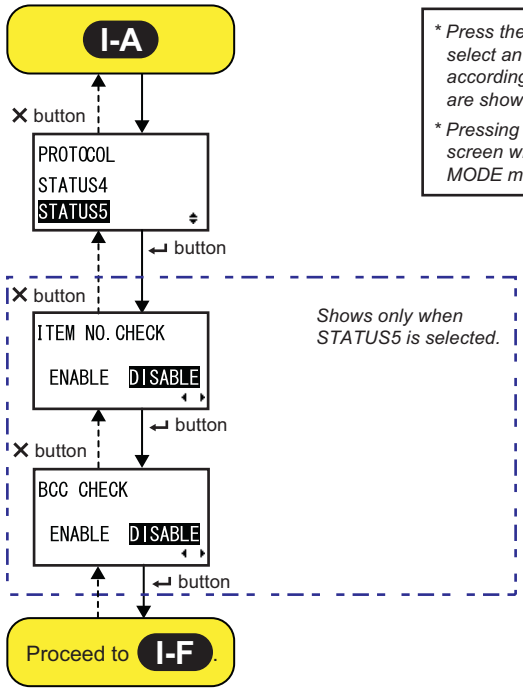
FINISH SETTING?

Confirm to complete the setting.

- **YES**: Returns to the user mode screen.
- **NO**: Returns to the NOTICE FUNCTION screen to select an item.



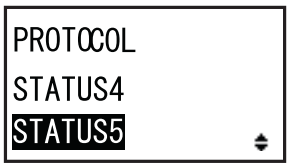
USB Setting


I-A
✕ button
PROTOCOL
STATUS4
STATUS5
↵ button
✕ button
ITEM NO. CHECK
ENABLE DISABLE
↵ button
✕ button
BCC CHECK
ENABLE DISABLE
↵ button
Proceed to I-F.
Shows only when STATUS5 is selected.
* Press the ◀, ▶, ▲or ▼button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
* Pressing the ⮌ button on each screen will revert to the INTERFACE MODE menu.

PROTOCOL

Set the communication protocol.

- **STATUS4**: When selected, the printer will proceed to the IGNORE CR/LF screen.
- **STATUS5**: When selected, the printer will proceed to the ITEM NO. CHECK screen.



ITEM NO. CHECK

Set the item number check function.

- **ENABLE**: Enable the item number check function.
- **DISABLE**: Disable the item number check function.

Note
Shows only if PROTOCOL is set to STATUS5.

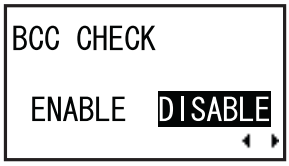


BCC CHECK

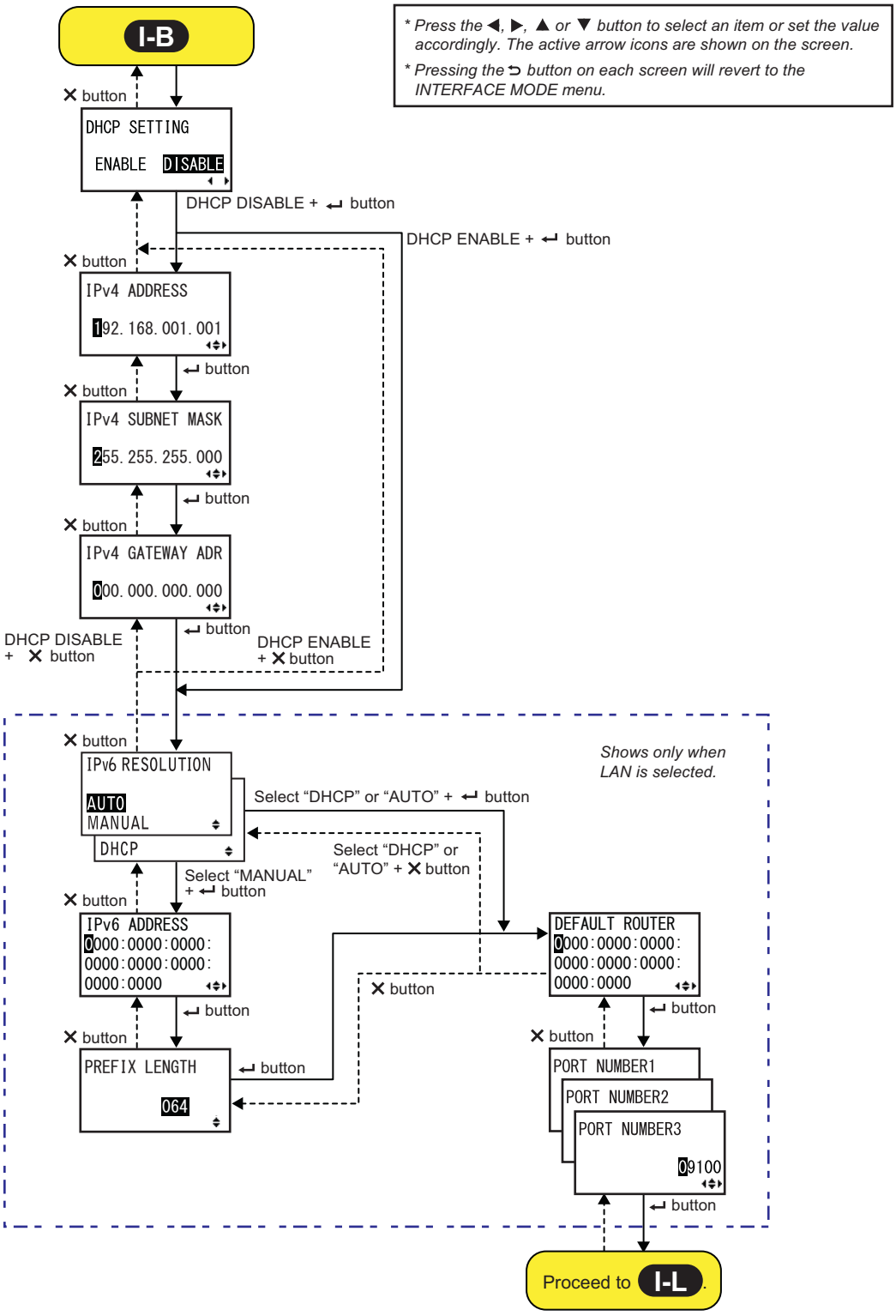
Set the BCC check function.

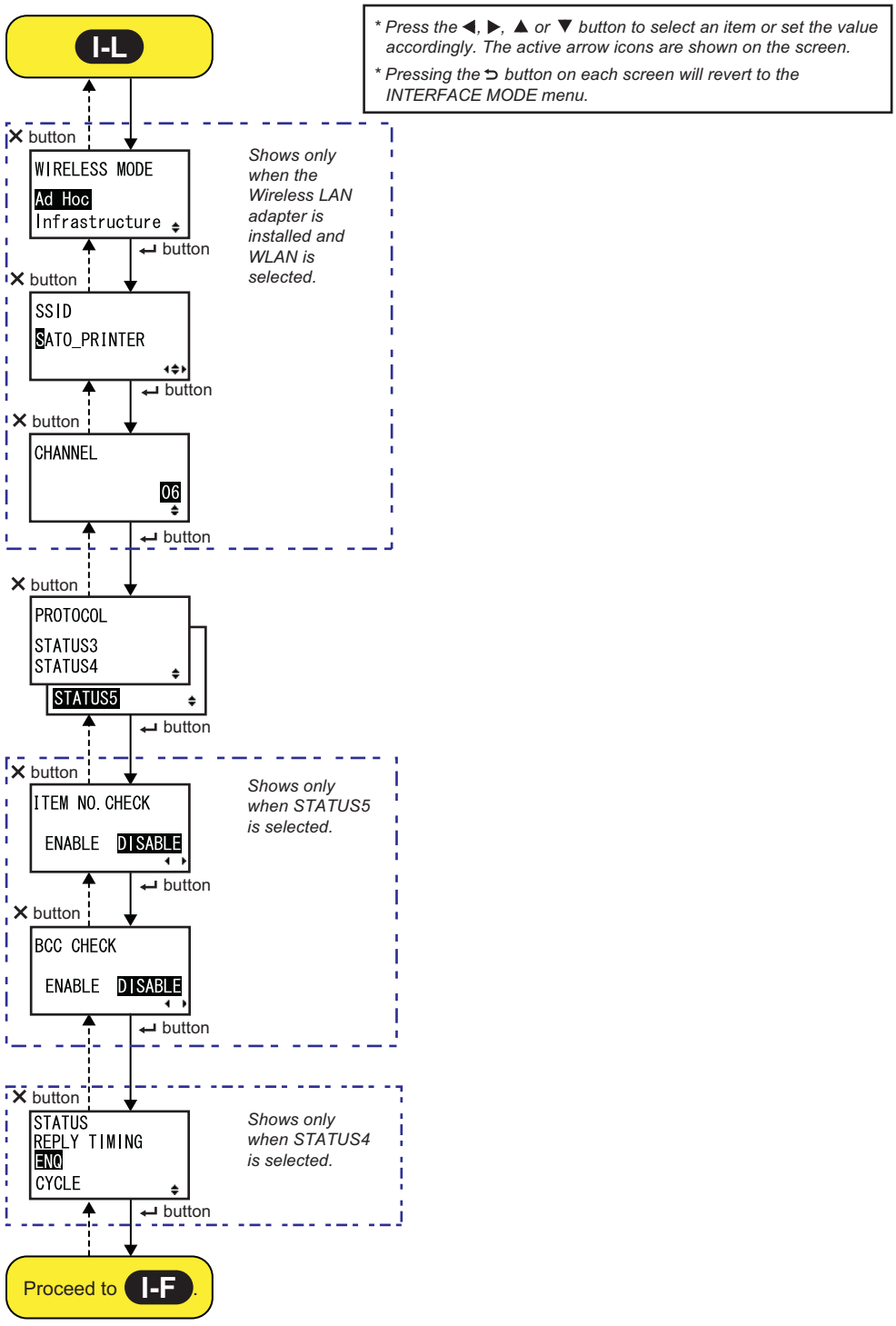
- **ENABLE**: Enable the BCC check function.
- **DISABLE**: Disable the BCC check function.

Note
Shows only if PROTOCOL is set to STATUS5.



LAN/Wireless LAN Setting




* Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
* Pressing the ⮌ button on each screen will revert to the INTERFACE MODE menu.
I-L
✕ button
WIRELESS MODE
Ad Hoc
Infrastructure
↵ button
SSID
SATO_PRINTER
CHANNEL
06
Shows only when the Wireless LAN adapter is installed and WLAN is selected.
PROTOCOL
STATUS3
STATUS4
STATUS5
ITEM NO. CHECK
ENABLE DISABLE
BCC CHECK
Shows only when STATUS5 is selected.
STATUS
REPLY TIMING
ENQ
CYCLE
Shows only when STATUS4 is selected.
Proceed to I-F.

DHCP SETTING

Enable or disable DHCP.

- **ENABLE**: Enable DHCP.
- **DISABLE**: Disable DHCP.

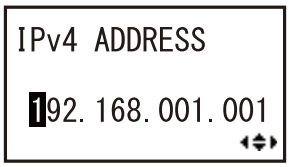
Note
- Shows only if the LAN or WLAN interface is selected.
- The setting for the WLAN interface will be effective only if you power on the printer again.



IPv4 ADDRESS

Set the IPv4 address.
The setting range is from 0.0.0.0 to 255.255.255.255.
The default value is 192.168.001.001.

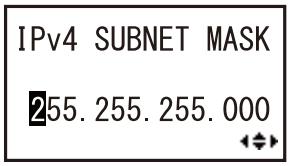
Note
- Shows only if the LAN or WLAN interface is selected.
- The setting will be effective only if you power on the printer again.



IPv4 SUBNET MASK

Set the IPv4 subnet mask address.
The setting range is from 0.0.0.0 to 255.255.255.255.
The default value is 255.255.255.000.

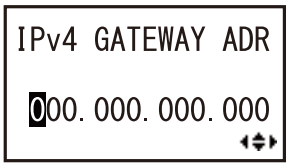
Note
- Shows only if the LAN or WLAN interface is selected.
- The setting will be effective only if you power on the printer again.



IPv4 GATEWAY ADR

Set the IPv4 gateway address.
The setting range is from 0.0.0.0 to 255.255.255.255.
The default value is 000.000.000.000 for LAN and 192.168.001.002 for WLAN.

Note
- Shows only if the LAN or WLAN interface is selected.
- The setting will be effective only if you power on the printer again.

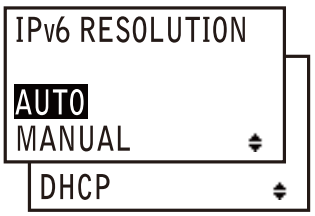


IPv6 RESOLUTION

Select IPv6 address setting method.
The options are as follows:

- **AUTO**
- **MANUAL**
- **DHCP**

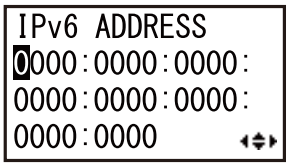
Note
Shows only if the LAN interface is selected.



IPv6 ADDRESS

Set the IPv6 address.

Note
Shows only if the LAN interface is selected and “MANUAL” is selected at “IPv6 RESOLUTION” screen.



PREFIX LENGTH

Set the prefix length.

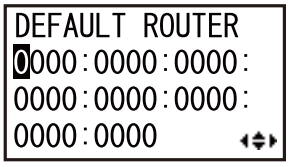
Note
Shows only if the LAN interface is selected and “MANUAL” is selected at “IPv6 RESOLUTION” screen.



DEFAULT ROUTER

Set the default router of IPv6.

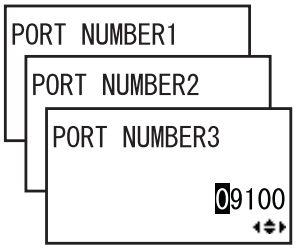
Note
Shows only if the LAN interface is selected and “MANUAL” is selected at “IPv6 RESOLUTION” screen.



PORT NUMBER

Set the LAN port numbers, 1 to 3.
The setting range is from 00001 to 65535.

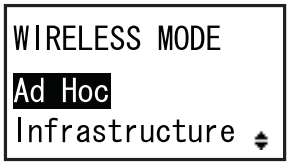
Note
- Shows only if the LAN interface is selected.
- Each port (1, 2 and 3) must be set to different values.
- The setting will be effective only if you power on the printer again.



WIRELESS MODE

Set the communication method of the wireless LAN.
The options are as follows:
- **Ad Hoc**
- **Infrastructure**

Note
- Shows only if the WLAN interface is selected.
- The setting will be effective only if you power on the printer again.



SSID

Set the SSID of the wireless LAN.
You can enter a maximum of thirty-two characters including alphabet (upper case and lower case), numbers and symbols.

Note
- Shows only if the WLAN interface is selected.
- The setting will be effective only if you power on the printer again.



CHANNEL

Set the communication channel of the wireless LAN.
The setting range is from 01 to 13 and the default value is 06.

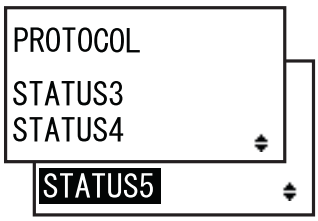
Note
- Shows only if the WLAN interface is selected.
- The setting will be effective only if you power on the printer again.
- When the channel has become invalid due to a region code change, the channel returns to its default setting.



PROTOCOL

Set the communication protocol.

- **STATUS3**: When selected, the printer will proceed to the IGNORE CR/LF screen.
- **STATUS4**: When selected, the printer will proceed to the STATUS REPLY TIMING screen.
- **STATUS5**: When selected, the printer will proceed to the ITEM NO. CHECK screen.



ITEM NO. CHECK

Set the item number check function.

- **ENABLE**: Enable the item number check function.
- **DISABLE**: Disable the item number check function.

Note
Shows only if PROTOCOL is set to STATUS5.

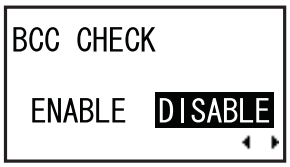


BCC CHECK

Set the BCC check function.

- **ENABLE**: Enable the BCC check function.
- **DISABLE**: Disable the BCC check function.

Note
Shows only if PROTOCOL is set to STATUS5.

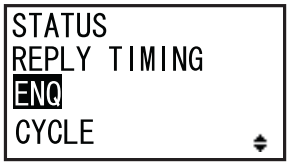


STATUS REPLY TIMING

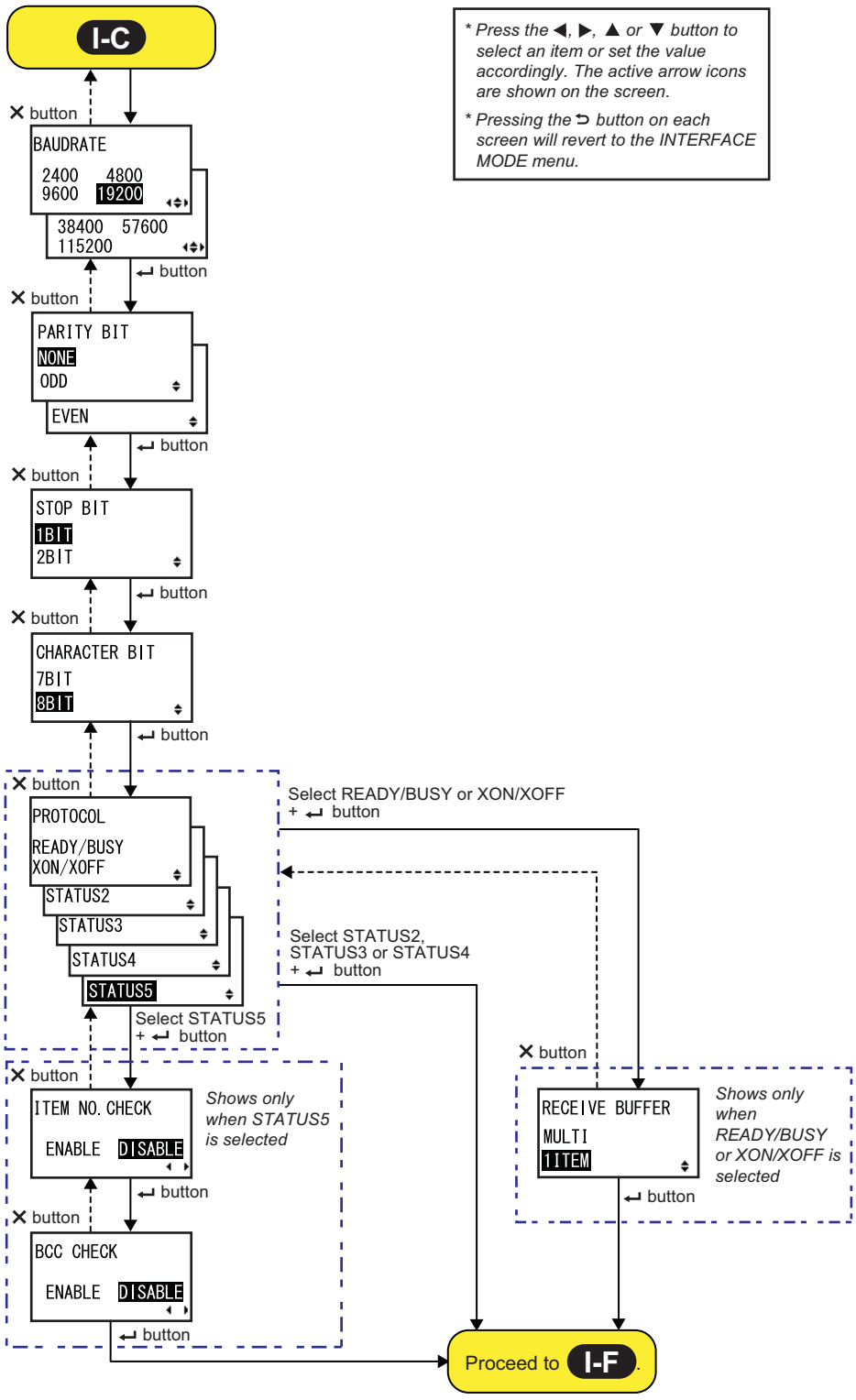
Set the timing for replying with the status information to the host.

- **ENQ**: Returns a status after receiving a Status Request (ENQ), which has been sent from the host.
- **CYCLE**: Returns a status from the printer to the host at an interval of 500 ms.

Note
Shows only if PROTOCOL is set to STATUS4.



RS-232C Setting



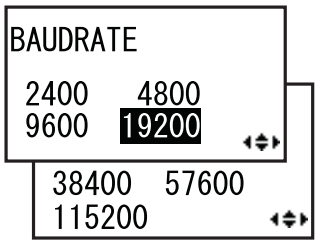
BAUDRATE

Set the RS-232C baud rate.
The following baud rates are available:

- **2400** (bps)
- **4800** (bps)
- **9600** (bps)
- **19200** (bps)
- **38400** (bps)
- **57600** (bps)
- **115200** (bps)

Note

- Shows only if the RS-232C interface is selected.
- The setting will be effective only if you power on the printer again.



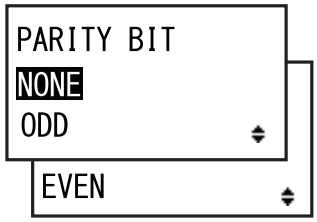
PARITY BIT

Set the RS-232C parity bit.
The following options are available:

- **NONE**
- **ODD**
- **EVEN**

Note

- Shows only if the RS-232C interface is selected.
- The setting will be effective only if you power on the printer again.



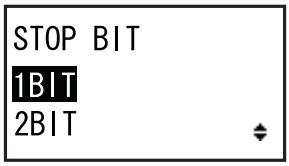
STOP BIT

Set the RS-232C stop bit.
The following options are available:

- **1BIT**
- **2BIT**

Note

- Shows only if the RS-232C interface is selected.
- The setting will be effective only if you power on the printer again.



CHARACTER BIT

Set the RS-232C data length.
The following options are available:

- **7BIT**
- **8BIT**

Note

- Shows only if the RS-232C interface is selected.
- The setting will be effective only if you power on the printer again.

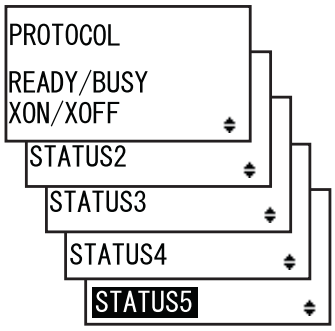


PROTOCOL

Set the communication protocol.

- **READY/BUSY**: When selected, the printer will proceed to the RECEIVE BUFFER screen.
- **XON/OFF**: When selected, the printer will proceed to the RECEIVE BUFFER screen.
- **STATUS2**: When selected, the printer will proceed to the IGNORE CR/LF screen.
- **STATUS3**: When selected, the printer will proceed to the IGNORE CR/LF screen.
- **STATUS4**: When selected, the printer will proceed to the IGNORE CR/LF screen.
- **STATUS5**: When selected, the printer will proceed to the ITEM NO. CHECK screen.

Note
The setting will be effective only if you power on the printer again.



ITEM NO. CHECK

Set the item number check function.

- **ENABLE**: Enable the item number check function.
- **DISABLE**: Disable the item number check function.

Note
Shows only if PROTOCOL is set to STATUS5.

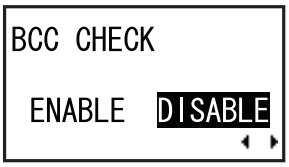


BCC CHECK

Set the BCC check function.

- **ENABLE**: Enable the BCC check function.
- **DISABLE**: Disable the BCC check function.

Note
Shows only if PROTOCOL is set to STATUS5.



RECEIVE BUFFER

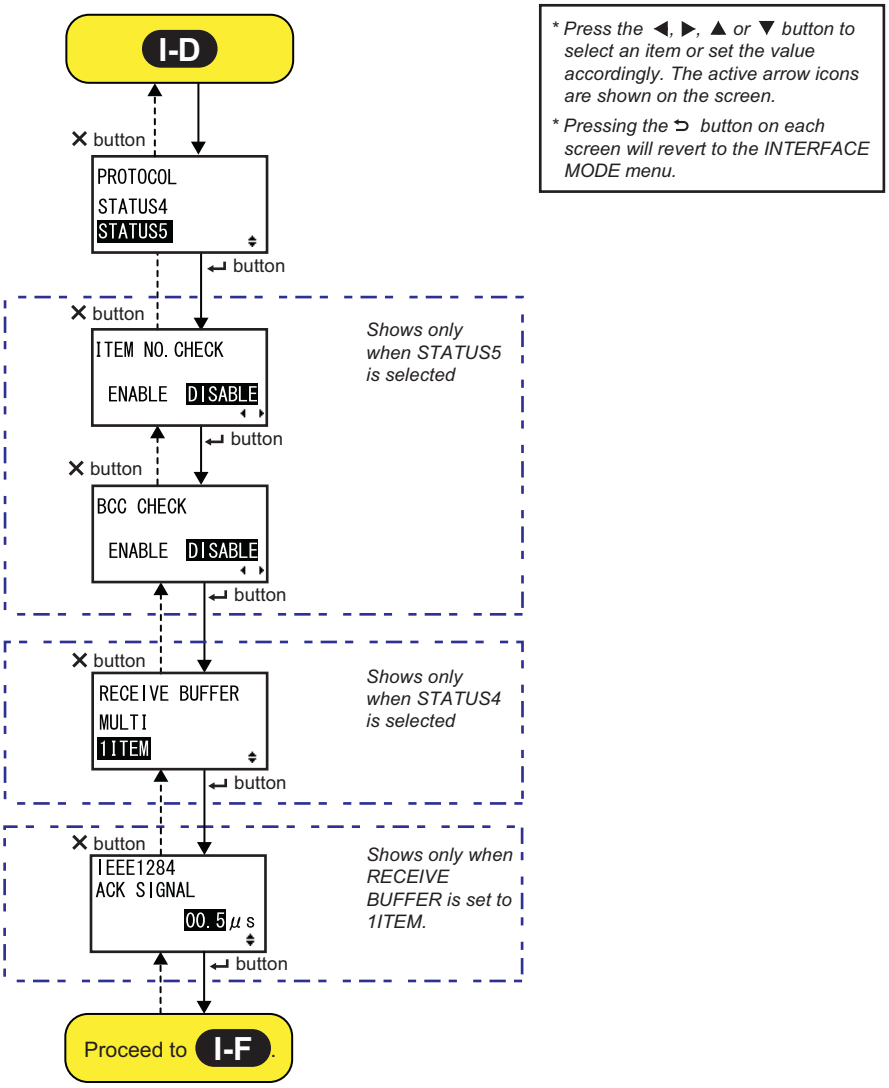
Set the receive buffer type.

- **MULTI**: Multiple receive buffers.
- **1ITEM**: A single receive buffer.

Note
Shows only if PROTOCOL is set to READY/BUSY or XON/XOFF.



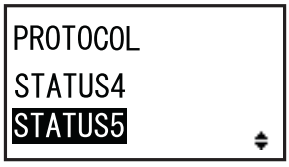
IEEE1284 Setting



PROTOCOL

Set the communication protocol.

- **STATUS4**: When selected, the printer will proceed to the RECEIVE BUFFER screen.
- **STATUS5**: When selected, the printer will proceed to the ITEM NO. CHECK screen.



ITEM NO. CHECK

Set the item number check function.

- **ENABLE**: Enable the item number check function.
- **DISABLE**: Disable the item number check function.

Note
Shows only if PROTOCOL is set to STATUS5.

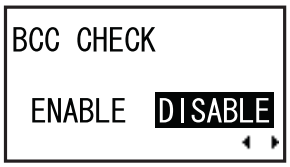


BCC CHECK

Set the BCC check function.

- **ENABLE**: Enable the BCC check function.
- **DISABLE**: Disable the BCC check function.

Note
Shows only if PROTOCOL is set to STATUS5.

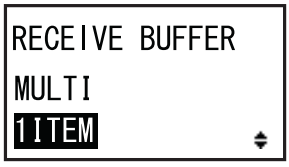


RECEIVE BUFFER

Set the receive buffer type.

- **MULTI**: Multiple receive buffers.
- **1ITEM**: A single receive buffer.

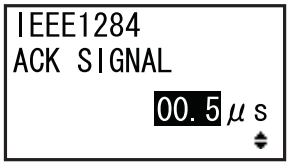
Note
Shows only if PROTOCOL is set to STATUS4.



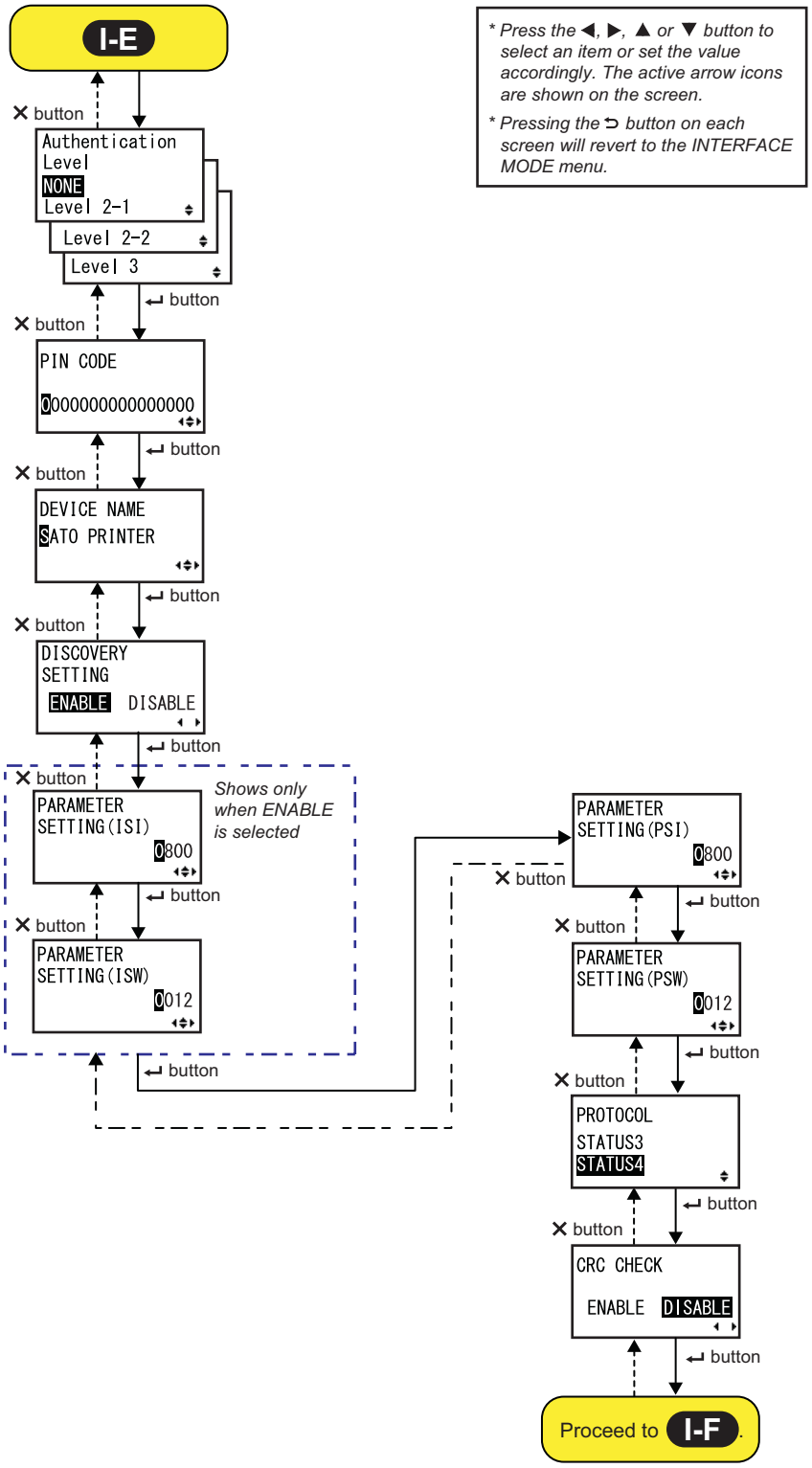
IEEE1284 ACK SIGNAL

Set the width of the IEEE1284 ACK signal.
The setting range is from 00.5 µs to 12.0 µs, and is adjustable in 0.1 µs steps.

Note
Shows only if the IEEE1284 interface is selected and RECEIVE BUFFER is set to 1ITEM.



Bluetooth Setting



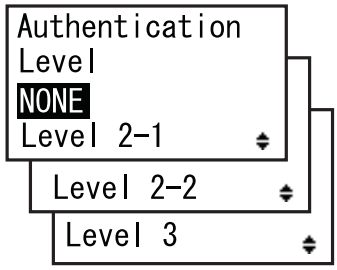
AUTHENTICATION LEVEL

Set the Bluetooth authentication level.
The following options are available:

- **NONE**: No authentication
- **Level 2-1**: PIN code authentication, service level
- **Level 2-2**: PIN code authentication, service level
- **Level 3**: PIN code authentication, link level

Note

- Shows only if the Bluetooth interface is selected.
- The setting will be effective only if you power on the printer again.

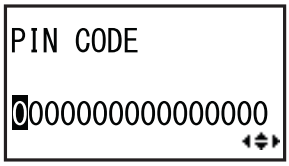


PIN CODE

Set the Bluetooth PIN code.
You can enter a maximum of sixteen characters including alphabet (upper case and lower case), numbers and symbols.

Note

- Shows only if the Bluetooth interface is selected.
- The setting will be effective only if you power on the printer again.

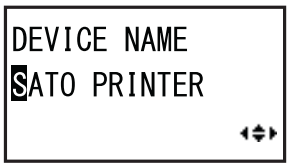


DEVICE NAME

Set the device name for the printer.
You can enter a maximum of twenty characters including alphabet (upper case and lower case), numbers and symbols.

Note

- Shows only if the Bluetooth interface is selected.
- The setting will be effective only if you power on the printer again.



DISCOVERY SETTING

Enable or disable the Bluetooth detection response.

- **ENABLE**: Enable the Bluetooth detection response.
- **DISABLE**: Disable the Bluetooth detection response.

Note

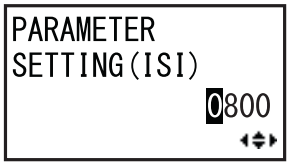
- Shows only if the Bluetooth interface is selected.
- The setting will be effective only if you power on the printer again.



PARAMETER SETTING (ISI)

Set the Bluetooth communication parameter (ISI).
The setting range is from 0012 to 1000.

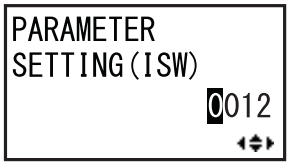
Note
- Shows only if the Bluetooth interface is selected and DETECTING SETTING is enabled.
- You cannot set the ISI value if it is smaller than the ISW value.
- The setting will be effective only if you power on the printer again.



PARAMETER SETTING (ISW)

Set the Bluetooth communication parameter (ISW).
The setting range is from 0011 to 1000.

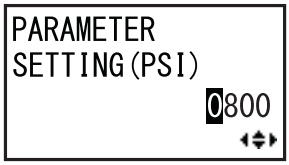
Note
- Shows only if the Bluetooth interface is selected and DETECTING SETTING is enabled.
- You cannot set the ISW value if it is greater than the ISI value.
- The setting will be effective only if you power on the printer again.



PARAMETER SETTING (PSI)

Set the Bluetooth communication parameter (PSI).
The setting range is from 0012 to 1000.

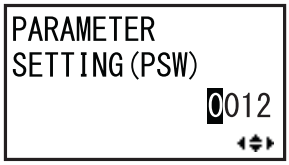
Note
- Shows only if the Bluetooth interface is selected.
- You cannot set the PSI value if it is smaller than the PSW value.
- The setting will be effective only if you power on the printer again.



PARAMETER SETTING (PSW)

Set the Bluetooth communication parameter (PSW).
The setting range is from 0011 to 1000.

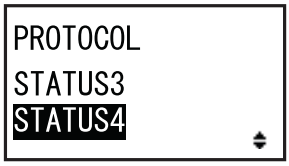
Note
- Shows only if the Bluetooth interface is selected.
- You cannot set the PSW value if it is greater than the PSI value.
- The setting will be effective only if you power on the printer again.



PROTOCOL

Set the communication protocol.
The following options are available:

- **STATUS3**
- **STATUS4**

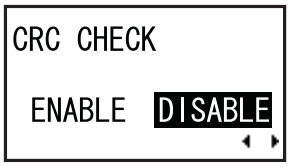


CRC CHECK

Set the CRC check function.

- **ENABLE**: Enable the CRC check function.
- **DISABLE**: Disable the CRC check function.

Note
Shows only if the Bluetooth interface is selected.

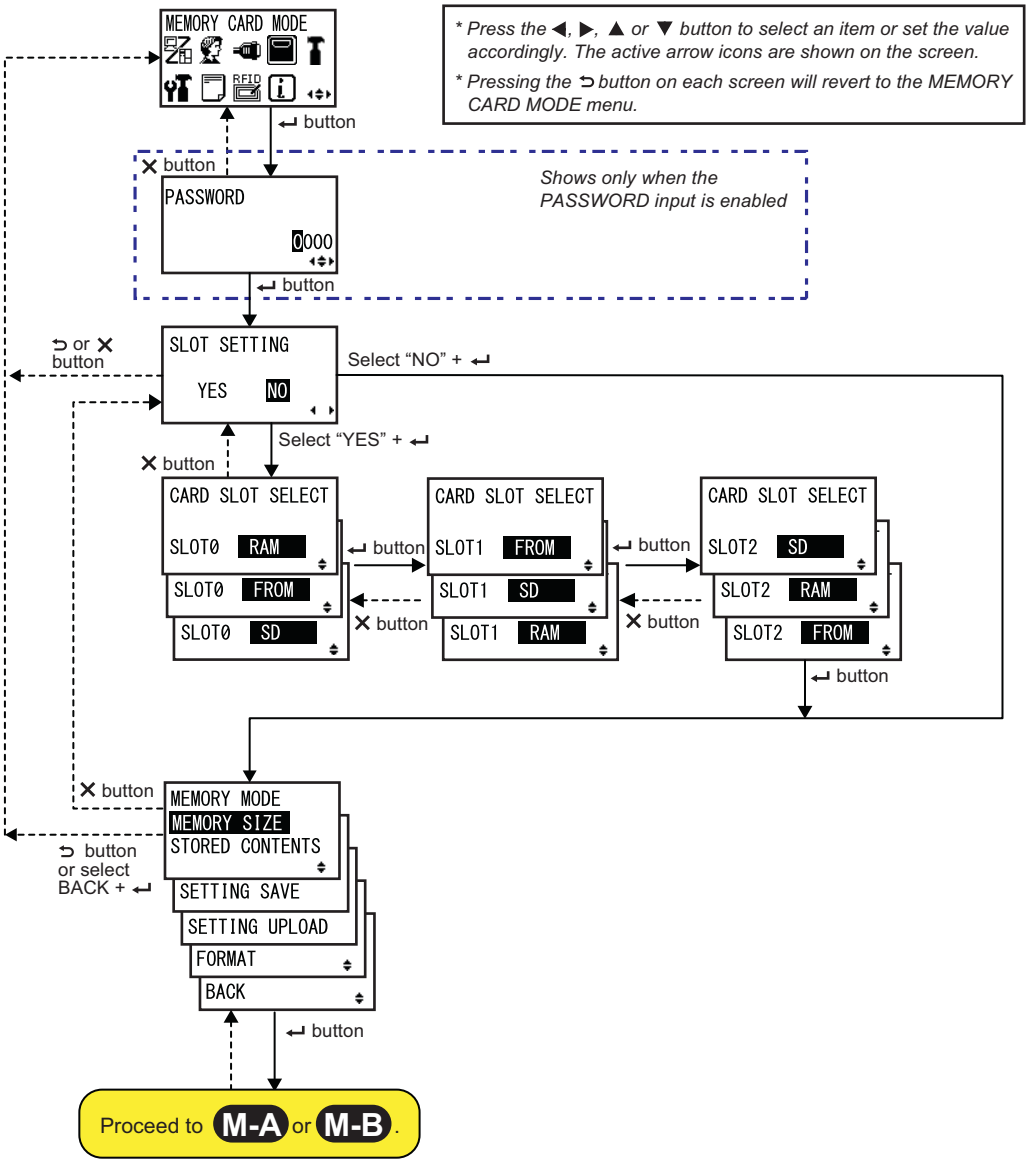


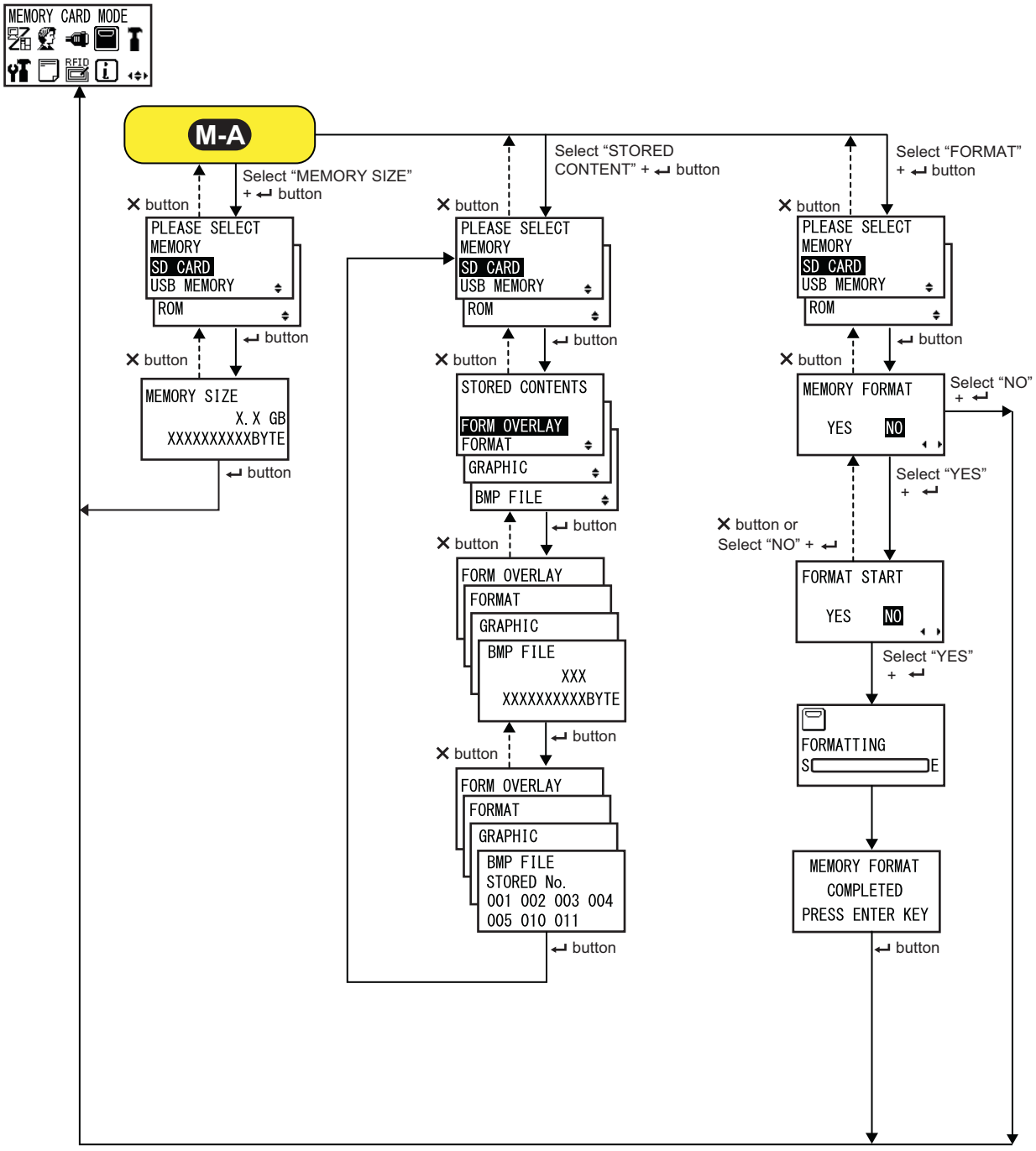
4.2.11 Memory Mode

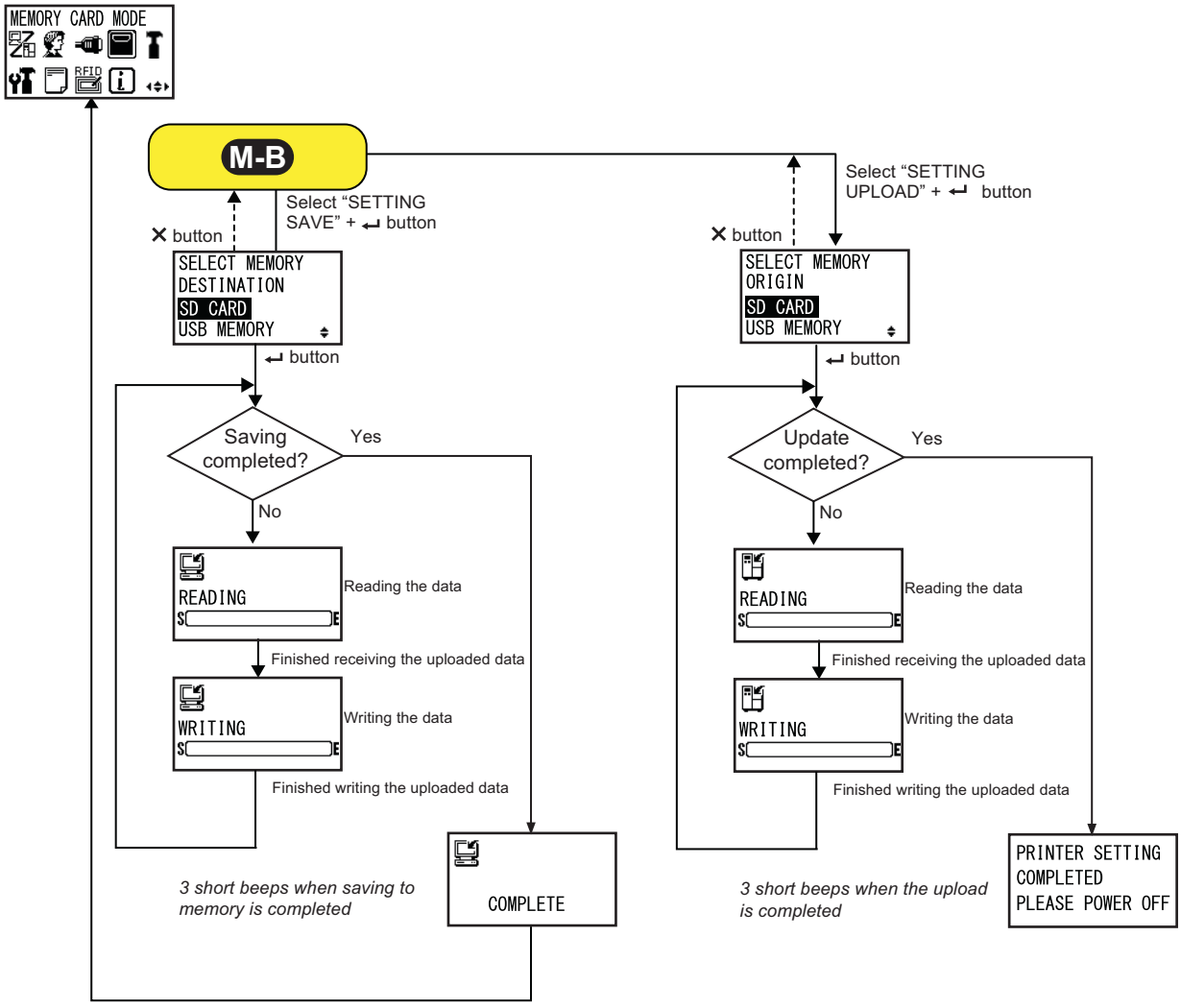
The flowchart shows the sequence of the setting screens for the memory mode. The table describes each setting screen in detail.

⚠ CAUTION

Be sure to perform a virus check for the USB memory or SD card before connecting it to the printer. SATO Corporation shall not be held responsible for a malfunction of the printer caused by a virus infection through the USB memory or SD card.




MEMORY CARD MODE
M-A
Select "MEMORY SIZE" + ↵ button
Select "STORED CONTENT" + ↵ button
Select "FORMAT" + ↵ button
✕ button
PLEASE SELECT MEMORY
SD CARD
USB MEMORY
ROM
↵ button
MEMORY SIZE
X.X GB
XXXXXXXXXXBYTE
STORED CONTENTS
FORM OVERLAY
FORMAT
GRAPHIC
BMP FILE
FORM OVERLAY
FORMAT
GRAPHIC
BMP FILE
XXX
XXXXXXXXXXBYTE
FORM OVERLAY
FORMAT
GRAPHIC
BMP FILE
STORED No.
001 002 003 004
005 010 011
MEMORY FORMAT
YES NO
Select "NO" + ↵
Select "YES" + ↵
✕ button or Select "NO" + ↵
FORMAT START
YES NO
Select "YES" + ↵
FORMATTING
S E
MEMORY FORMAT
COMPLETED
PRESS ENTER KEY



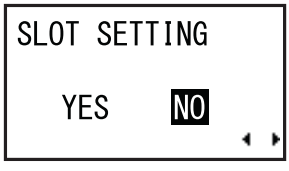
SLOT SETTING

Select whether or not to set the memory storage allocation for use with the Memory card command <CC>.

- **YES**: Proceed to change the storage allocation for the memory slot.
- **NO**: No change to the memory slot.

Note

Refer to the Programming reference for details on the command.



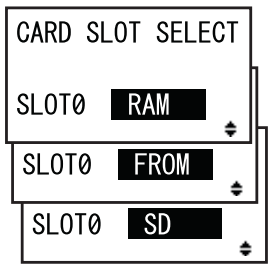
CARD SLOT SELECT

Set the memory storage allocation for each card slot for use with the Memory card command <CC>. A total of three slots can be set (Slot 0-2). Each card slot can be allocated to the following options:

- **RAM**
- **FROM** (Flash ROM)
- **SD** (SD card)
- **USB** (USB memory)
- **NO USE**

Note

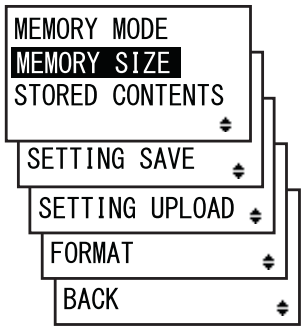
- Other than the NO USE option, a memory storage allocated to a card slot cannot be allocated to another card slot.
- Refer to the Programming reference for details on the command.



MEMORY MODE

Perform the memory settings.
The following options are available:

- **MEMORY SIZE**: Check the free size of the selected memory.
- **STORED CONTENTS**: Shows the information that is registered in the selected memory.
- **SETTING SAVE**: Save the printer setting information to the selected memory.
- **SETTING UPLOAD**: Update the printer setting information stored in the selected memory.
- **FORMAT**: Initialize and format the selected memory.
- **BACK**: Returns to the MEMORY CARD MODE screen.



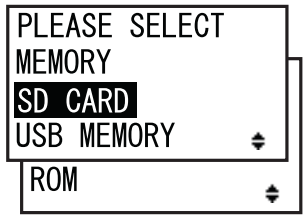
PLEASE SELECT MEMORY

Select the memory you want to perform the settings.
The following options are available:

- **SD CARD**
- **USB MEMORY**
- **ROM**

Note

Shows only if MEMORY MODE is set to MEMORY SIZE, STORED CONTENTS or FORMAT.

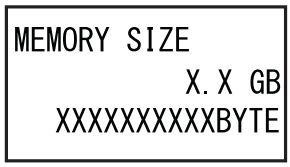


MEMORY SIZE

Check the free size of the selected memory.
The memory unit (BYTE, KB, MB, GB) changes automatically according to the free space of the memory.

Note

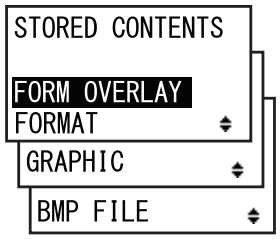
After you press the ↵ **ENTER** button, the screen returns to MEMORY CARD MODE.



STORED CONTENTS

Select the type of information registered in the memory.
The following options are available:

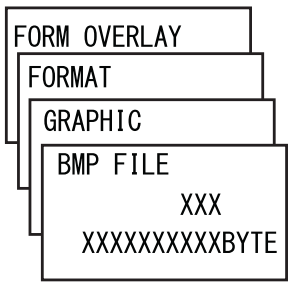
- **FORM OVERLAY**
- **FORMAT**
- **GRAPHIC**
- **BMP FILE**



MEMORY INFORMATION

Shows the number of files and total size of the selected type of information registered in the memory.

The maximum number of files is 999.



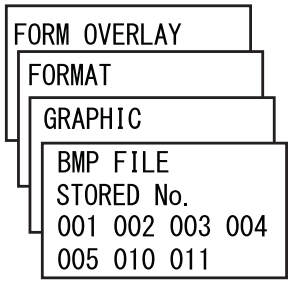
STORED NO. INFORMATION

Shows the stored number of the registered information.

The stored number range is from 001 to 999.

Note

After you press the ↵ **ENTER** button, the screen returns to PLEASE SELECT MEMORY.

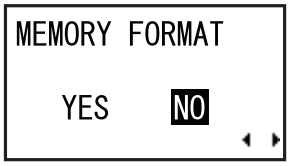


MEMORY FORMAT

Select whether or not to format the memory.

- **YES**: Format the memory.
- **NO**: Do not format the memory.

Note
If you select NO, the screen returns to MEMORY CARD MODE.

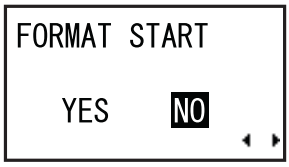


FORMAT START

Confirm to start formatting the memory.

- **YES**: Start to format the memory.
- **NO**: Cancel formatting the memory.

Note
If you select NO, the screen returns to MEMORY FORMAT.



FORMATTING

Shows the formatting progress of the memory.

Note
After formatting the memory card, a completion message will show.

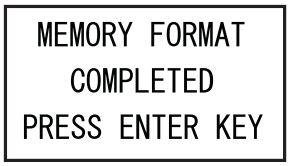


MEMORY FORMAT COMPLETED

Shows that the formatting of the memory card is completed.

Note

After you press the ↵ **ENTER** button, the screen returns to MEMORY CARD MODE.



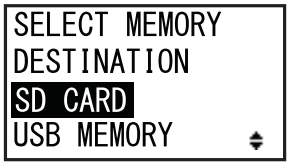
SELECT MEMORY DESTINATION

Select the memory to save the printer setting information.
The following options are available:

- **SD CARD**
- **USB MEMORY**

Note

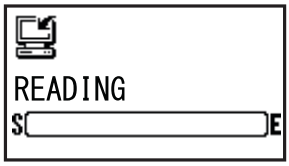
- Shows only if MEMORY MODE is set to SETTING SAVE.
- The setting information of the wireless LAN is saved only if the wireless LAN is connected.



READING (SETTING SAVE)

Shows while the printer is reading the setting information data.

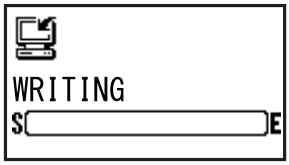
Note
Automatically shows the WRITING screen upon completion.



WRITING (SETTING SAVE)

Shows while the printer is writing the setting information data.

Note
Shows the COMPLETE screen automatically upon completion.



COMPLETE

Shows when the printer setting information has been saved to memory.

Note
After three beeps, the screen returns to MEMORY CARD MODE.

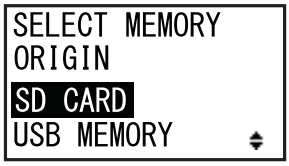


SELECT MEMORY ORIGIN

Select the memory to copy the printer setting information.
The following options are available:

- **SD CARD**
- **USB MEMORY**

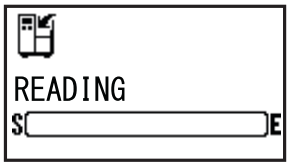
Note
Shows only if MEMORY MODE is set to SETTING UPLOAD.



READING (SETTING UPLOAD)

Shows while the printer is reading the setting information data.

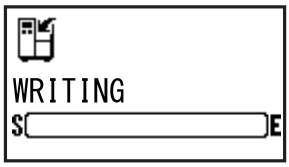
Note
Automatically shows the WRITING screen upon completion.



WRITING (SETTING UPLOAD)

Shows while the printer is writing the setting information data.

Note
Automatically shows the PRINTER SETTING COMPLETED screen upon completion.

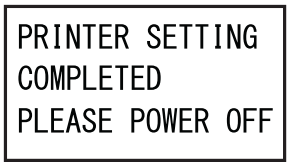


PRINTER SETTING COMPLETED

Shows when the printer setting information has been uploaded to the printer.

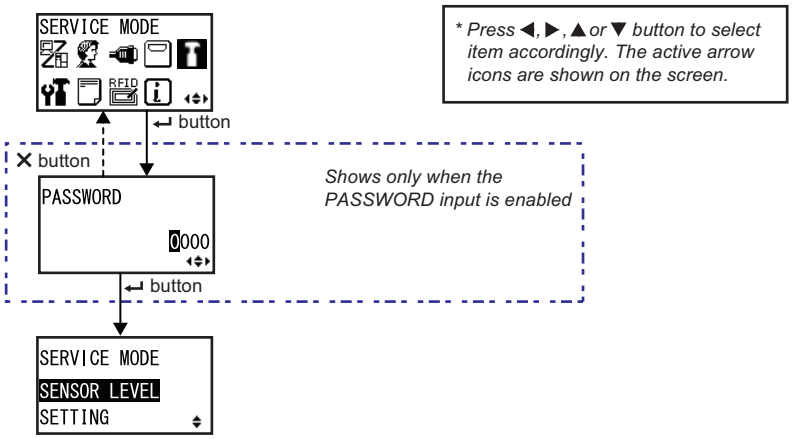
Note

- Three beeps will sound when the upload is completed.
- The setting will be effective only if you power on the printer again.



4.2.12 Service Mode

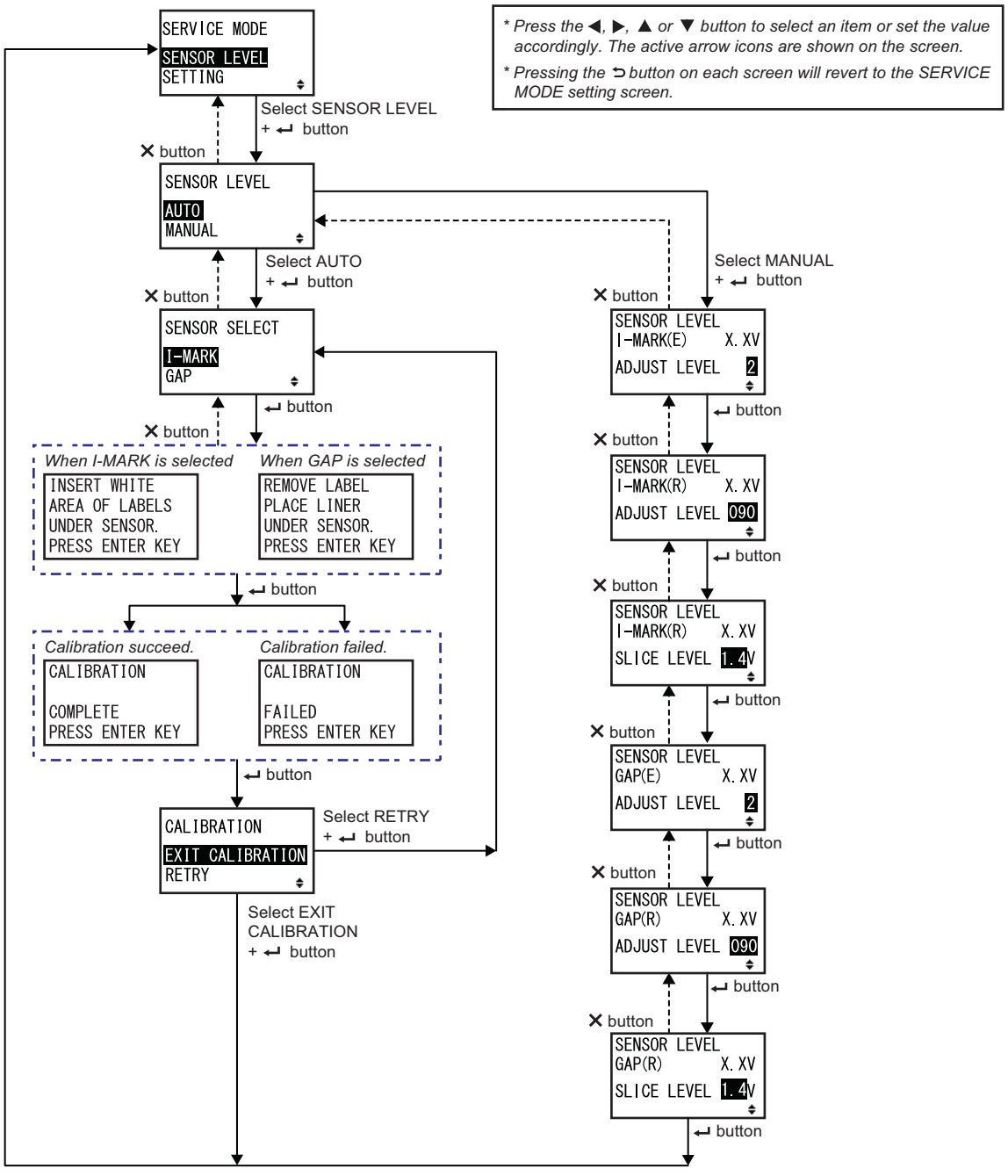
In the SERVICE MODE menu, you can perform sensor level adjustments and various function settings of the printer.



SERVICE MODE	
Select one from the two service setting modes. • **SENSOR LEVEL**: Adjust the sensor level. • **SETTING**: Set the various function settings of the printer.	

Sensor Level Adjustments

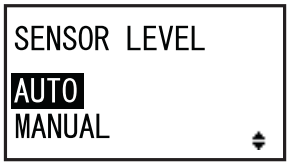
The flowchart shows the sequence of the setting screens for the sensor level adjustments. The table describes each setting screen in detail.



SENSOR LEVEL

Set the sensor adjustment method.

- **AUTO**: Automatically adjust the sensor level.
- **MANUAL**: Manually adjust the sensor level.



SENSOR SELECT

Select the media sensor type for the sensor adjustment.

- **I-MARK**: Adjust the I-mark sensor.
- **GAP**: Adjust the Gap sensor.

Note
Shows only if AUTO is selected for the sensor adjustment method.



I-mark sensor adjustment explanation screen

This screen shows the instruction to place the media for I-mark sensor adjustment.
Shows only if I-MARK is selected in the SENSOR SELECT screen.

After placing the media, press the ↵ **ENTER** button to start the automatic sensor adjustment.



Gap sensor adjustment explanation screen

This screen shows the instruction to place the media for I-mark sensor adjustment.
Shows only if GAP is selected in the SENSOR SELECT screen.

After placing the label, press the ↵ **ENTER** button to start the automatic sensor adjustment.



CALIBRATION COMPLETE/FAILED

This screen shows the result of the automatic sensor adjustment.

- **COMPLETE**: The automatic adjustment has succeeded.
- **FAILED**: The automatic adjustment has failed.

Press the ↵ **ENTER** button to proceed to the next screen.

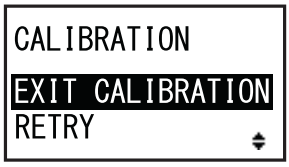




CALIBRATION

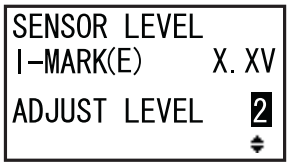
Select to exit the automatic sensor adjustment or retry the automatic sensor adjustment.

- **EXIT CALIBRATION**: Exit the automatic sensor adjustment.
- **RETRY**: Retry the automatic sensor adjustment.



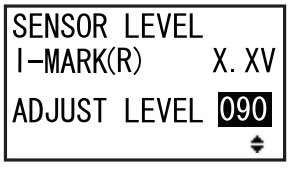
SENSOR LEVEL I-MARK(E)

Shows the current level (Emission) of the I-mark sensor on the upper part of the screen.
This offset determines how soon the sensor will respond to an incoming I-mark. The adjustment range is from 1 to 3 and is shown on the bottom line of the screen.



SENSOR LEVEL I-MARK(R)

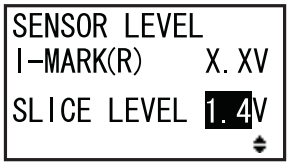
Shows the current level (Reception) of the I-mark sensor on the upper part of the screen.
This offset determines how soon the sensor will respond to an incoming I-mark. The adjustment range is from 0 to 127 and is shown on the bottom line of the screen.



SENSOR LEVEL I-MARK SLICE

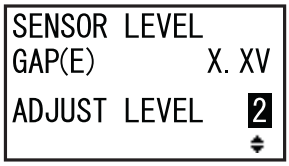
Shows the current level (Reception) of the I-mark sensor on the upper part of the screen.
The slice level is calculated automatically and shown on the bottom line.
The slice level can be set to 0.0 V, or from 0.3 V to 2.9 V. (adjustable in increments of 0.1 V)

Note
- The slice level is set automatically when the value is set to 0.0 V.
- In the case of automatic calculation, the calculated value will be shown automatically after printing.



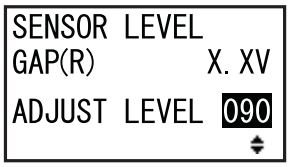
SENSOR LEVEL GAP(E)

Shows the current level (Emission) of the gap sensor on the upper part of the screen.
This offset determines how soon the sensor will respond to an incoming gap. The adjustment range is from 1 to 3 and is shown on the bottom line of the screen.



SENSOR LEVEL GAP(R)

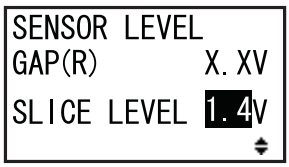
Shows the current level (Reception) of the gap sensor on the upper part of the screen.
This offset determines how soon the sensor will respond to an incoming gap. The adjustment range is from 0 to 127 and is shown on the bottom line of the screen.



SENSOR LEVEL GAP SLICE

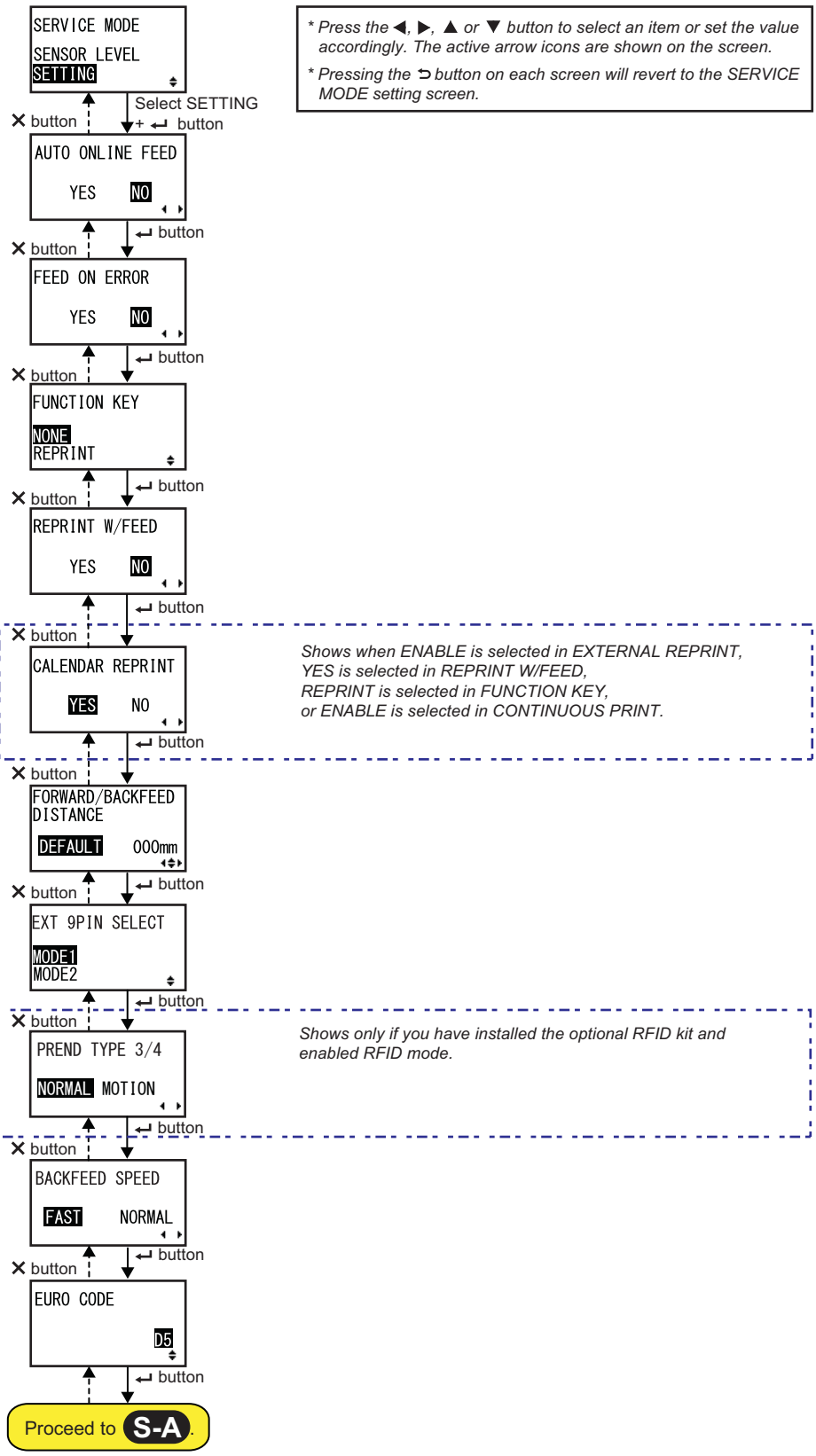
Shows the current level (Reception) of the gap sensor on the upper part of the screen.
The slice level is calculated automatically and shown on the bottom line.
The slice level can be set to 0.0 V, or from 0.3 V to 2.9 V. (adjustable in increments of 0.1 V)

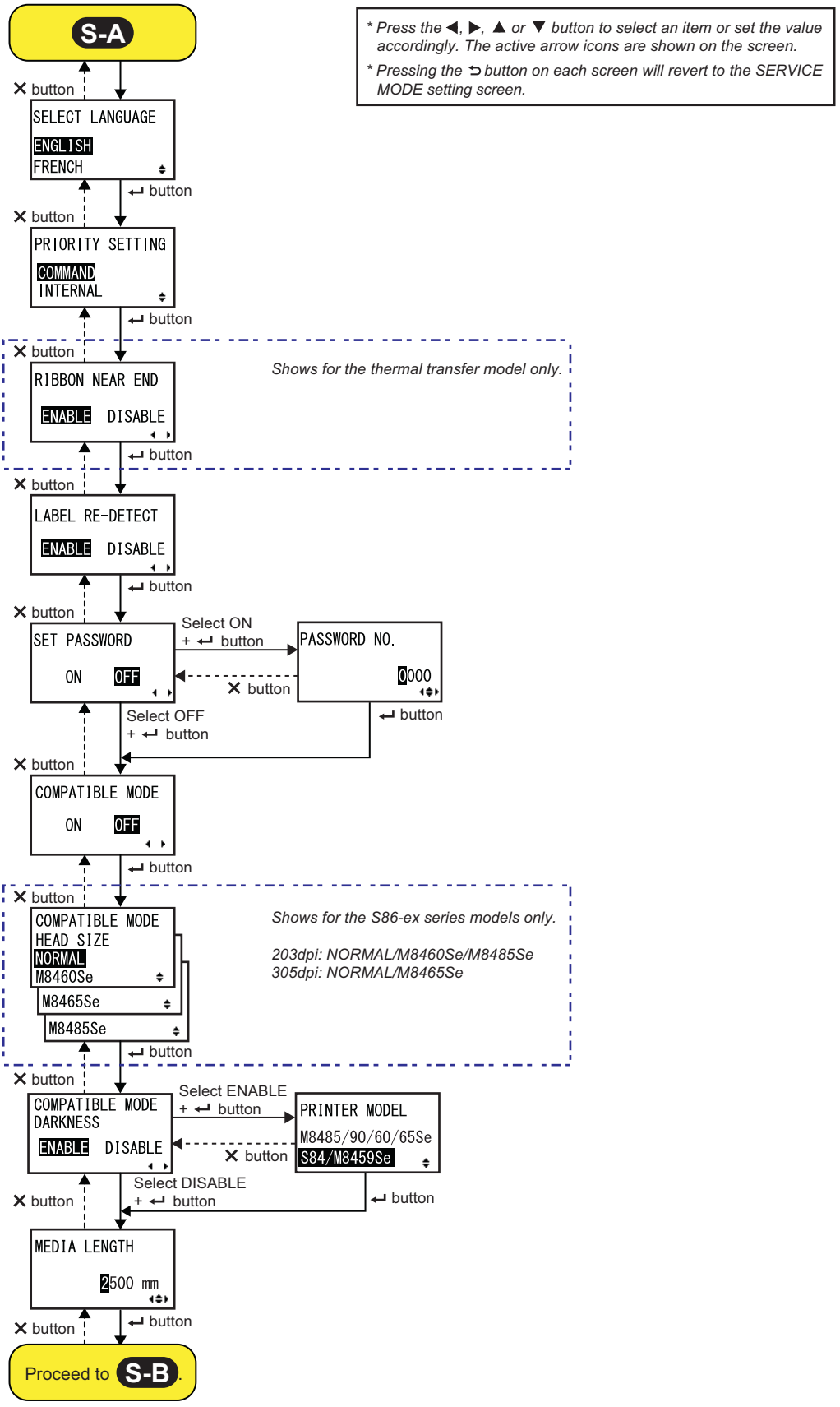
Note
- The slice level is set automatically by the firmware when the value is set to 0.0 V.
- In the case of automatic calculation, the calculated value will be shown automatically after printing.

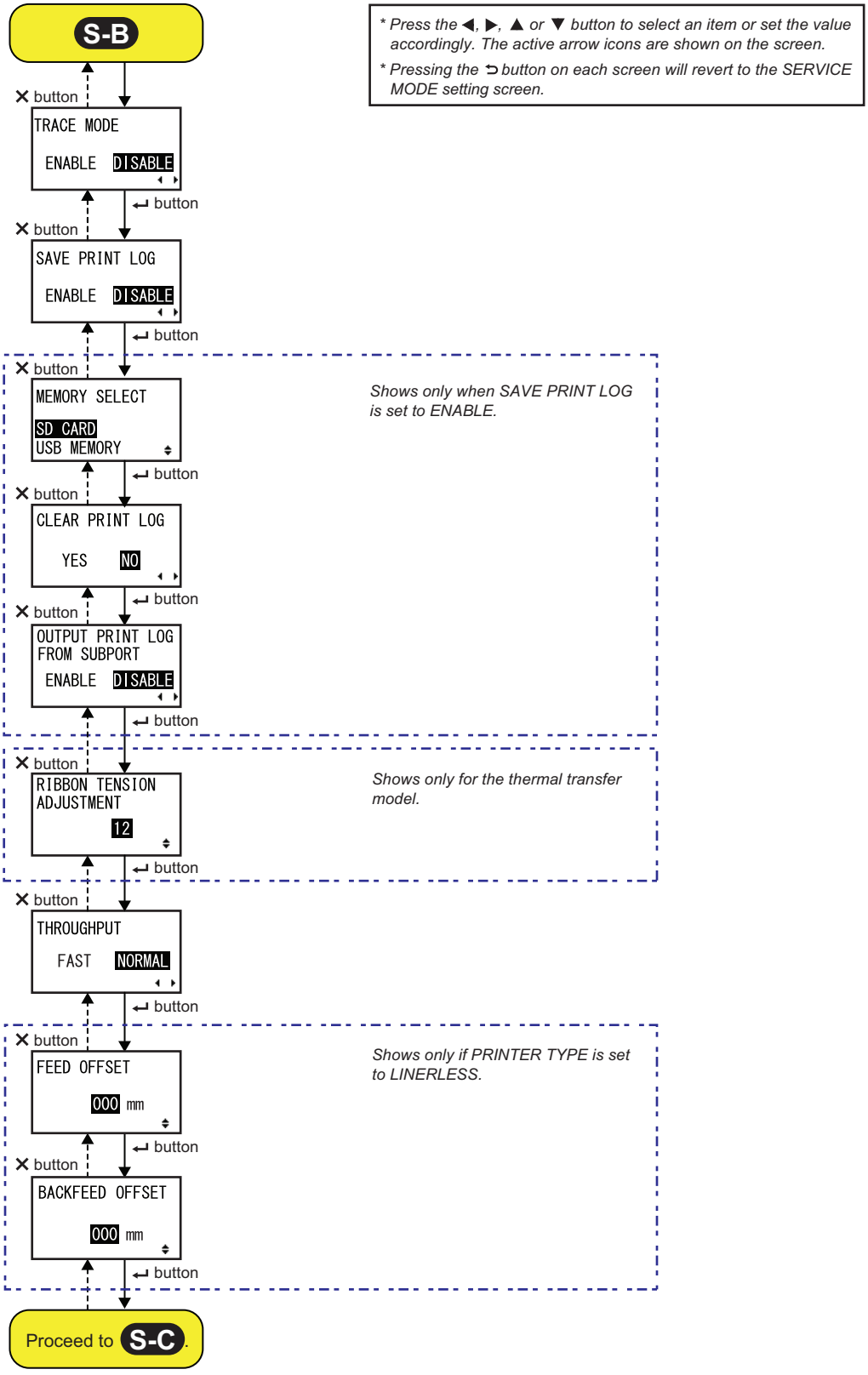


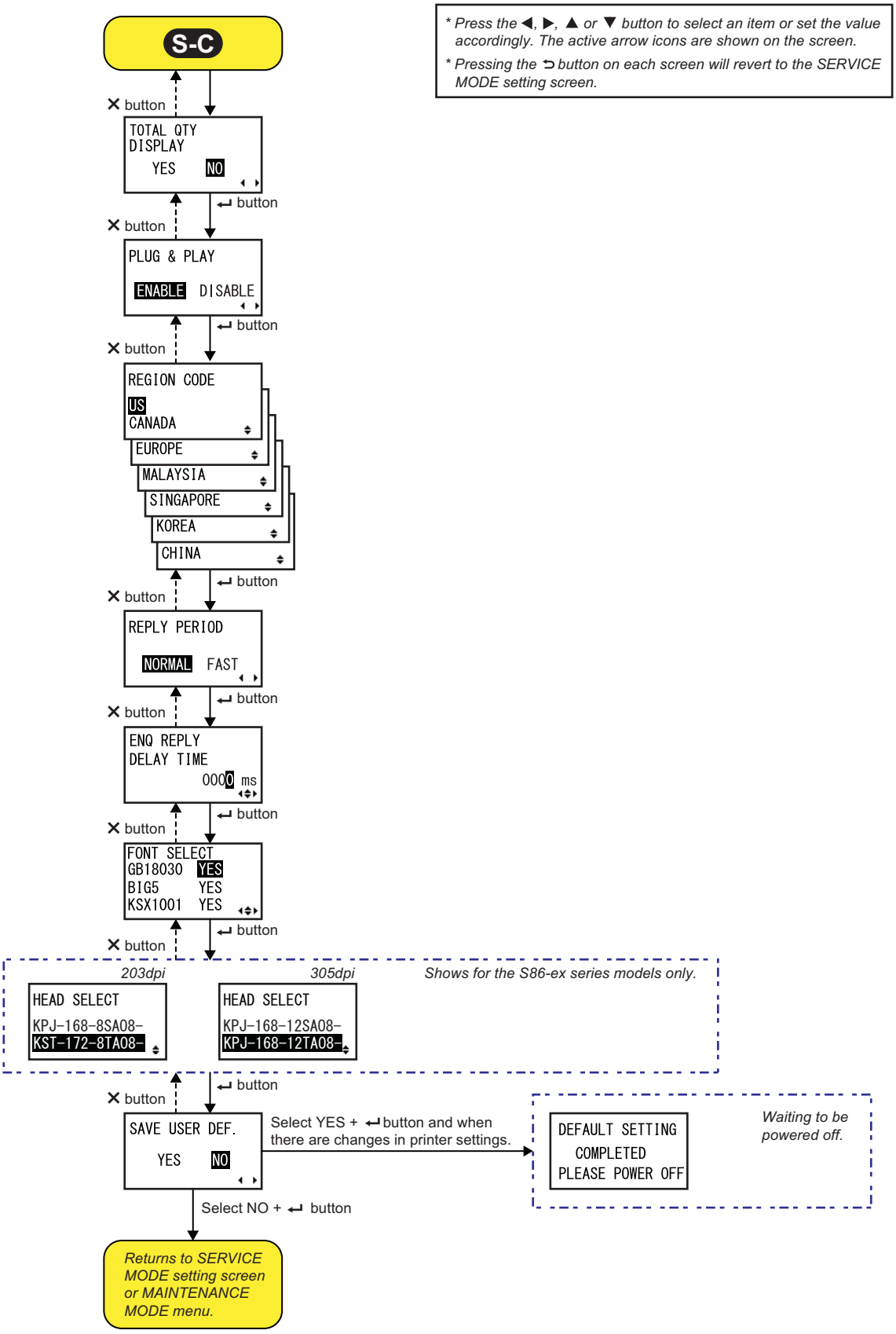
Function Settings

The flowchart shows the sequence of the setting screens for the function settings. The table describes each setting screen in detail.


SERVICE MODE
SENSOR LEVEL
SETTING
Select SETTING
+ ↵ button
✕ button
AUTO ONLINE FEED
YES NO
↵ button
FEED ON ERROR
YES NO
FUNCTION KEY
NONE
REPRINT
REPRINT W/FEED
YES NO
CALENDAR REPRINT
YES NO
FORWARD/BACKFEED DISTANCE
DEFAULT 000mm
EXT 9PIN SELECT
MODE1
MODE2
PREND TYPE 3/4
NORMAL MOTION
BACKFEED SPEED
FAST NORMAL
EURO CODE
D5
Proceed to S-A.
* Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
* Pressing the ⮌ button on each screen will revert to the SERVICE MODE setting screen.
Shows when ENABLE is selected in EXTERNAL REPRINT, YES is selected in REPRINT W/FEED, REPRINT is selected in FUNCTION KEY, or ENABLE is selected in CONTINUOUS PRINT.
Shows only if you have installed the optional RFID kit and enabled RFID mode.


S-A
* Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
* Pressing the ⮌ button on each screen will revert to the SERVICE MODE setting screen.
✕ button
SELECT LANGUAGE
ENGLISH
FRENCH
↵ button
PRIORITY SETTING
COMMAND
INTERNAL
RIBBON NEAR END
ENABLE DISABLE
Shows for the thermal transfer model only.
LABEL RE-DETECT
ENABLE DISABLE
SET PASSWORD
ON OFF
Select ON
+ ↵ button
PASSWORD NO.
0000
Select OFF
+ ↵ button
COMPATIBLE MODE
ON OFF
COMPATIBLE MODE
HEAD SIZE
NORMAL
M8460Se
M8465Se
M8485Se
Shows for the S86-ex series models only.
203dpi: NORMAL/M8460Se/M8485Se
305dpi: NORMAL/M8465Se
COMPATIBLE MODE
DARKNESS
ENABLE DISABLE
Select ENABLE
+ ↵ button
PRINTER MODEL
M8485/90/60/65Se
S84/M8459Se
Select DISABLE
+ ↵ button
MEDIA LENGTH
2500 mm
Proceed to S-B

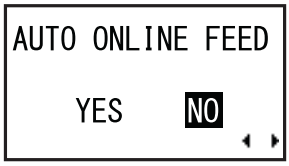

S-B
× button
TRACE MODE
ENABLE DISABLE
↵ button
× button
SAVE PRINT LOG
ENABLE DISABLE
↵ button
× button
MEMORY SELECT
SD CARD
USB MEMORY
↵ button
× button
CLEAR PRINT LOG
YES NO
↵ button
× button
OUTPUT PRINT LOG
FROM SUBPORT
ENABLE DISABLE
↵ button
× button
RIBBON TENSION
ADJUSTMENT
12
↵ button
× button
THROUGHPUT
FAST NORMAL
↵ button
× button
FEED OFFSET
000 mm
↵ button
× button
BACKFEED OFFSET
000 mm
↵ button
Proceed to S-C.
* Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
* Pressing the ⮌ button on each screen will revert to the SERVICE MODE setting screen.
Shows only when SAVE PRINT LOG is set to ENABLE.
Shows only for the thermal transfer model.
Shows only if PRINTER TYPE is set to LINERLESS.


* Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
* Pressing the ⮌ button on each screen will revert to the SERVICE MODE setting screen.
S-C
✕ button
TOTAL QTY DISPLAY
YES NO
↵ button
PLUG & PLAY
ENABLE DISABLE
REGION CODE
US
CANADA
EUROPE
MALAYSIA
SINGAPORE
KOREA
CHINA
REPLY PERIOD
NORMAL FAST
ENQ REPLY DELAY TIME
0000 ms
FONT SELECT
GB18030 YES
BIG5 YES
KSX1001 YES
203dpi
HEAD SELECT
KPJ-168-8SA08-
KST-172-8TA08-
305dpi
HEAD SELECT
KPJ-168-12SA08-
KPJ-168-12TA08-
Shows for the S86-ex series models only.
SAVE USER DEF.
YES NO
Select YES + ↵ button and when there are changes in printer settings.
DEFAULT SETTING
COMPLETED
PLEASE POWER OFF
Waiting to be powered off.
Select NO + ↵ button
Returns to SERVICE MODE setting screen or MAINTENANCE MODE menu.

AUTO ONLINE FEED

Set the auto online feed function.
This function enables the printer to automatically feed media in online mode after power on.

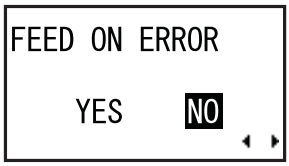
- **YES**: Feed the media in online mode at power on.
- **NO**: Do not feed the media in online mode at power on.



FEED ON ERROR

Set the online feed function.
This function enables the printer to feed media automatically when recovering from a head open error or when starting up the printer and changing to online mode.

- **YES**: Feed the media when changing to online mode.
- **NO**: Do not feed the media when changing to online mode.



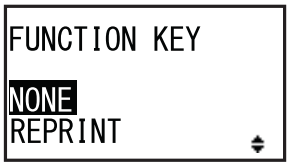
FUNCTION KEY

Allocate the following functions to the ⮌ **FUNCTION** button.

- **NONE**: Do not allocate any function.
- **REPRINT**: Allocate the reprint function.

Note

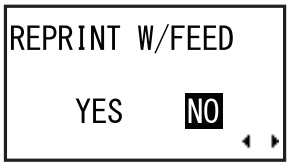
The ⮌ **FUNCTION** button is disabled when NONE is set.



REPRINT W/FEED

Enable or disable the reprint function using the ⮉ **FEED** button.
If this function is enabled, you can reprint the last print job by pressing the ⮉ **FEED** button in online mode.

- **YES**: Enable the reprint function.
- **NO**: Disable the reprint function.

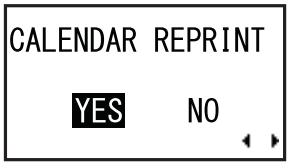


CALENDAR REPRINT

Perform the calendar reprint setting.

- **YES**: The updated calendar data (date and time) according to the RTC (Real Time Clock) is included in the reprint data.
- **NO**: Print exactly the same data as before.

Note
Shows only if EXTERNAL REPRINT is set to ENABLE, REPRINT W/ FEED is set to YES, FUNCTION KEY is set to REPRINT, or CONTINUOUS PRINT is set to ENABLE.

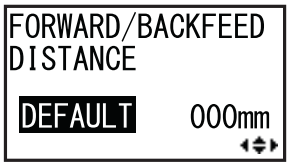


FORWARD/BACKFEED DISTANCE

Set the feed length in the forward and backward directions.

- **DEFAULT**: Enable the printer to operate using the fixed value maintained in the printer.
- **000mm**: Set the feed length to enable the printer to operate using this distance. The setting range of forward/backward feed length is from 001 mm to 255 mm (0.04” to 10”).
  The actual forward/backward feed length is equivalent to the offset adjustment value + the paper feed length.

Note
- If using thermal transfer for printing, set the feed distance to less than 30 mm (1.2”) to avoid detection of the ribbon end by mistake.
- If the value is larger than the distance between the print head and the option stop position, the media may shift away from the platen during backward feed.

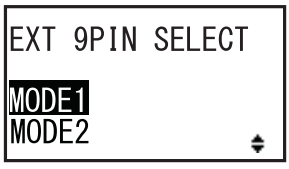


EXT 9PIN SELECT

Set the output mode of the external signal pin 9 when using a 14-pin connector (pin 6 when using a 25-pin connector).

- **MODE1**: The output signal becomes “Active” when there is remaining print data without error in online mode.
- **MODE2**: The output signal becomes “Active” when the printer is ONLINE.

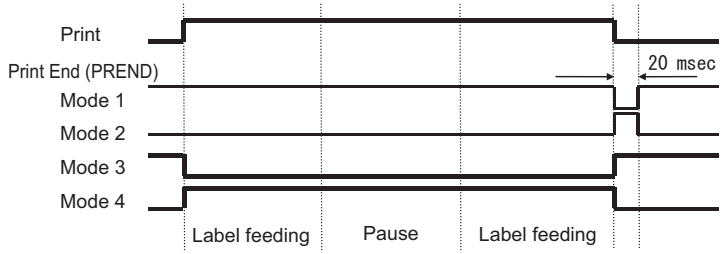
Note
Refer to the **Timing Chart of the EXT Output Signal (Online)** for details.



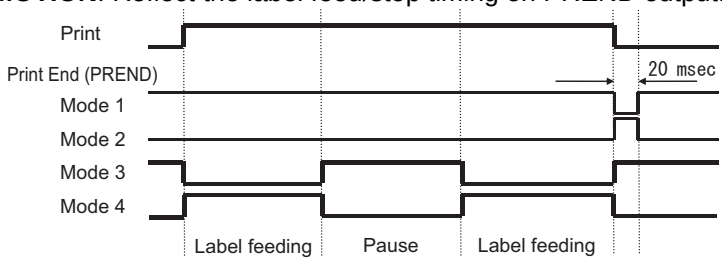
PREND TYPE 3/4

Select whether to reflect the label feed/stop timing on PREND output signal in External signal MODE3, 4.

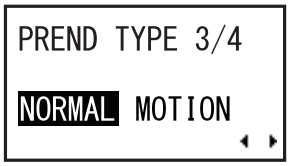
- **NORMAL**: Do not reflect the label feed/stop timing on PREND output.



- **MOTION**: Reflect the label feed/stop timing on PREND output.



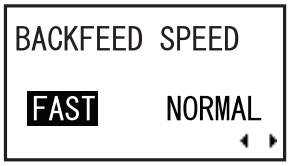
Note
Shows only if you have installed the optional RFID kit and enabled the RFID mode.



BACKFEED SPEED

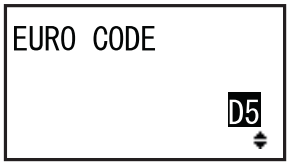
Specify the backfeed speed.

- **FAST**: Set to a speed of six inches per second.
- **NORMAL**: Set to a speed of four inches per second.



EURO CODE

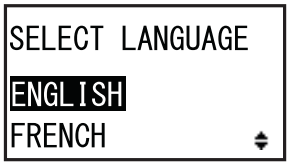
Set the European currency symbol to a hex code.
The setting range is from 00 to FF (hexadecimal).



SELECT LANGUAGE

Set the LCD language.
The following languages are available:

- **ENGLISH**
- **FRENCH**
- **GERMAN**
- **SPANISH**
- **PORTUGUESE**
- **ITALIAN**
- **CHINESE** (Simplified Chinese)
- **DUTCH**
- **RUSSIAN**



PRIORITY SETTING

Set the priority for the system commands.

- **COMMAND**: Certain system commands that have been sent to the printer have the priority to overwrite the printer configuration set by the LCD operator panel.
- **INTERNAL**: The above mentioned printer configuration set by the LCD operator panel will not be replaced by the sent command.

System commands that can be assigned priority are as follows:
Print Darkness <#E>, Print Darkness <#F>, Print Speed <CS>, Position Offset <A3>, Print Mode <PM>, Print Method <PH>

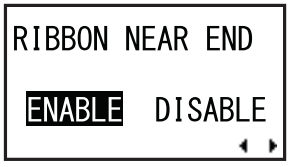


RIBBON NEAR END

Enable or disable the detection of the ribbon near end.

- **ENABLE**: Detect and notify when the ribbon is about to run out.
- **DISABLE**: Do not detect the ribbon near end.

Note
Shows for the thermal transfer model only.



LABEL RE-DETECT

Set whether or not to re-detect the label pitch when the power is on after the head opens/closes.

- **ENABLE**: Re-detect the label pitch.
- **DISABLE**: Do not re-detect the label pitch.

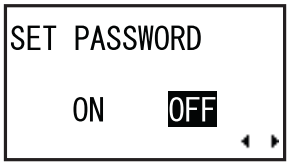


SET PASSWORD

Enable or disable password input to various modes.

- **ON**: Password input is required to enter various modes.
- **OFF**: Password input is not required to enter various modes.

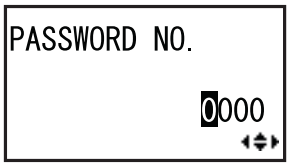
You can enable password input for the following modes:
USER MODE, INTERFACE MODE, MEMORY MODE,
ADVANCED MODE, HEX DUMP MODE and SERVICE MODE.



PASSWORD NO.

Set the four digit password for entering various modes.

Move the cursor using the ◀/▶ buttons, change the value using the ▲/▼ buttons and then press the ↵ **ENTER** button to confirm the password.

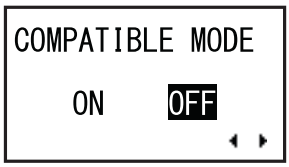


COMPATIBLE MODE

Set the compatibility with the printer operation of existing models.

- **ON**: Keep the compatibility with the printer operation of existing models.
- **OFF**: Disable the compatibility with the printer operation of existing models.

Note
For details on the compatible mode, refer to **Section 8.3 About Compatible Mode**.

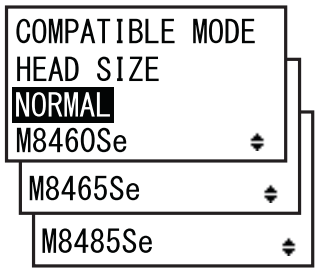


COMPATIBLE MODE HEAD SIZE

Set the head width for S86-ex series models.
The options vary depending on the head density. Corresponding head width are as follows:

Model Name	Option	Head Width (mm)
S86-ex (203 dpi)	NORMAL	167.5
	M8460Se	152.0
	M8485Se	128.0
S86-ex (305 dpi)	NORMAL	167.5
	M8465Se	152.0

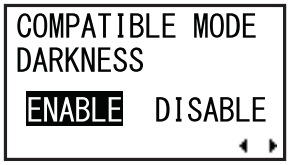
Note
- Shows for S86-ex series models only and if COMPATIBLE MODE is set to ON.
- Refer to **Section 8.3.2 Compatible Mode - Print Head Width (only for S86-ex printer)** for details on the affected items.



COMPATIBLE MODE DARKNESS

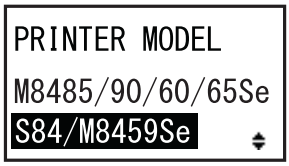
Enable or disable the system command Print Darkness <#E>.

- **ENABLE**: Enable you to execute the Print Darkness <#E>.
- **DISABLE**: Ignore the Print Darkness <#E>.



PRINTER MODEL

Select the printer model based on print darkness in compatible mode.



- **M8485/90/60/65Se**: Triple the value for Print Darkness <#E> and set it as the print darkness.

Print Darkness value <#E>	**The value converted as Print Darkness value <#F>**
1	3
2	6
3	9

- **S84/M8459Se**: Double the value for Print Darkness <#E> and set it as the print darkness.

Print darkness value <#E>	**The value converted as Print Darkness value <#F>**
1	2
2	4
3	6
4	8
5	10

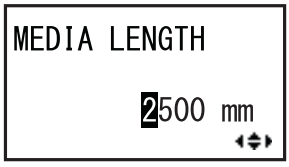
Note

- Shows only if COMPATIBLE MODE DARKNESS is set to ENABLE.
- This table explains that the system accepts the legacy Print Darkness setting command and does not guarantee that the printed darkness of the succeeding model will be the same as the older model.

MEDIA LENGTH

Set the maximum length of the media to be used.
This function affects the printable area (lengthwise) and media size checking function. It is necessary to set this value based on the actual media length to be used.
The setting range varies depending on the model as follows:

Model Name	Setting Range (mm)	Default Value (mm)
S84-ex (203 dpi)	0 - 2500	2500
S84-ex (305 dpi)	0 - 1500	1500
S84-ex (609 dpi)	0 - 400	400
S86-ex (203 dpi)	0 - 1249	1249
S86-ex (305 dpi)	0 -1249	1249



TRACE MODE

Enable or disable the function to show the printer operation status through icons in online mode. The following operation status are available:



: Data reception: Shows after receiving any data.

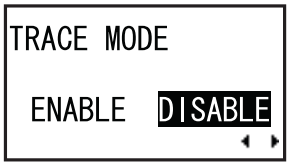


: Data edition: Shows after receiving ESC (1BH) A.



Print: Shows after a print job.

Each icon will be overwritten and cleared when changing to online mode.



SAVE PRINT LOG

Enable or disable to save the printer operation log to a memory card.

- **ENABLE**: Save the history data to a memory card.
- **DISABLE**: Do not save the history data to a memory card.



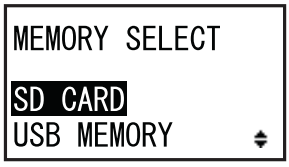
MEMORY SELECT

Select the storage memory for saving the printer operation log.
SD CARD or USB MEMORY can be selected.

⚠ CAUTION

Be sure to perform a virus check for the USB memory or SD card before connecting it to the printer. SATO Corporation shall not be held responsible for a malfunction of the printer caused by a virus infection through the USB memory or SD card.

Note
Shows only if SAVE PRINT LOG is set to ENABLE.

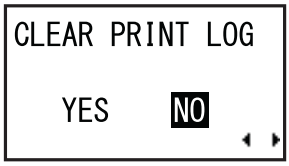


CLEAR PRINT LOG

Select whether or not to clear the history data in the memory card.

- **YES**: Clear the history data.
- **NO**: Do not clear the history data.

Note
Shows only if SAVE PRINT LOG is set to ENABLE.

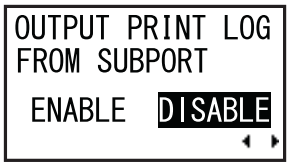


OUTPUT PRINT LOG FROM SUBPORT

Output the printer operation log to the sub port in real time (when the status has changed).

- **ENABLE**: Enable the sub port and output the history data from it.
- **DISABLE**: Disable the sub port and do not output any history data from it.

Note
Shows only if SAVE PRINT LOG is set to ENABLE.

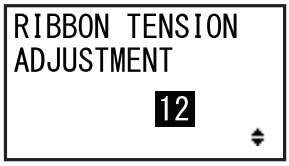


RIBBON TENSION ADJUSTMENT

Adjust the ribbon tension for the backfeed if scuffing (horizontal black line) occurs.
The ribbon is tensed when using a smaller value, and is loosened when using a larger value.
The setting range varies depending on the head density as follows:

Head Density	Setting Range	Default Value
203 dpi	0 - 15	12
305 dpi	0 - 15	5
609 dpi	0 - 15	1

Note
Shows only for the thermal transfer model.

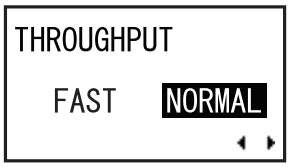


THROUGHPUT

Set the interval from backfeed to forward feed or from forward feed to backfeed.

- **FAST**: The interval is shortened and the throughput is improved.
- **NORMAL**: Use the existing interval.

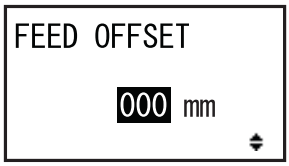
Note
The printer may not operate with the FAST setting, depending on the operating environment.



FEED OFFSET

Set the feed distance in LINERLESS mode.
The setting range is from 000 to 250 mm.

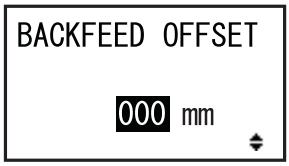
Note
Shows only if PRINTER TYPE in ADVANCED MODE is set to LINERLESS.



BACKFEED OFFSET

Set the backfeed distance in LINERLESS mode.
The setting range is from 000 to 250 mm.

Note
Shows only if PRINTER TYPE in ADVANCED MODE is set to LINERLESS.

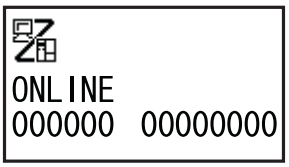


TOTAL QTY DISPLAY

Set whether or not to show the total print quantity.

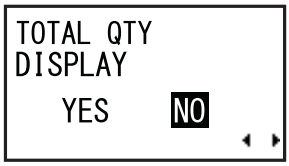
- **YES**: Shows the total print quantity and current print quantity.
- **NO**: Shows the current print quantity.

YES is selected



NO is selected





PLUG & PLAY

Enable or disable the Plug and play function of the printer.

- **ENABLE**: Enable the Plug and play function.
- **DISABLE**: Disable the Plug and play function.

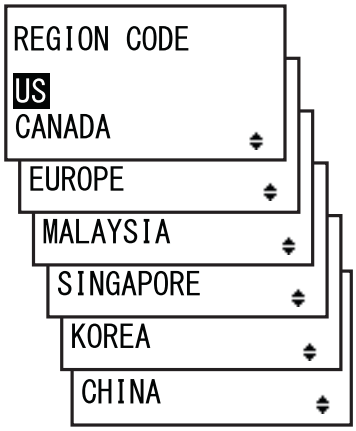
Note
This function will affect the IEEE1284 interface connectivity because it uses the DEVICE ID response of the IEEE1284.



REGION CODE

Set the region code of the wireless LAN.
The channel range varies depending on the region code as follows:

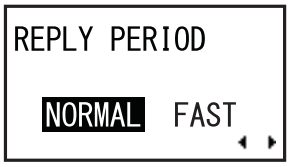
Region	Region Code	Channel Range
USA	US	1 - 11ch
CANADA	CANADA	1 - 11ch
Europe	EUROPE	1 - 13ch
Malaysia	MALAYSIA	1 - 13ch
Singapore	SINGAPORE	1 - 13ch
Korea	KOREA	1 - 13ch
China	CHINA	1 - 13ch



REPLY PERIOD

Set the LAN reply timing.

- **NORMAL**: Reply intervals of 500 to 1000 milliseconds.
- **FAST**: Reply intervals of 200 to 400 milliseconds.



ENQ REPLY DELAY TIME

Set the ENQ reply delay time.
The setting range is from 0000 to 9999 ms and is adjustable by 1 ms.

Note

- If “0000ms” is selected, the printer sends an ENQ response with no delay.
- If status 4 is set as the cyclic response mode, the printer sends an ENQ response with no delay for cycle response or ENQ command.

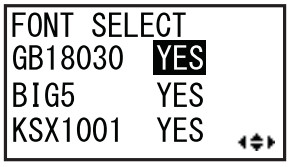


FONT SELECT

Select a font from the stored fonts.

- **GB18030**: Simplified Chinese
- **BIG 5**: Traditional Chinese
- **KSX1001**: Korean

- **YES**: Printable
- **NO**: Non-printable



Move the cursor using the ▲/▼ buttons, change the value using the ◀/▶ buttons and then press the ↵ **ENTER** button to set the value.
The printable maximum size of the TrueType font varies depending on the setting as follows:

GB18030	BIG5	KSX1001	Available TrueType font size (MB)
YES	YES	YES	4.6
YES	YES	NO	5.5
YES	NO	YES	5.6
YES	NO	NO	6.5
NO	YES	YES	10.6
NO	YES	NO	10.7
NO	NO	YES	10.8
NO	NO	NO	11.7

Note
When the printer tries to print a TrueType font that is bigger than the maximum size, a command error occurs.

HEAD SELECT

Set the type of print head installed in the S86-ex printer.

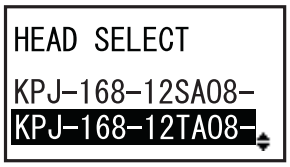
Select according to the first fourteen to fifteen characters of the print head serial number.
The selection varies depending on the print head density.

Note
- Shows only for S86-ex series model with the firmware version later than 61.00.00.06.
- If the installed print head and the selected type do not match, the printing cannot be done correctly. Make sure to set correctly for correct printing.

S86-ex (203dpi):



S86-ex (305dpi):

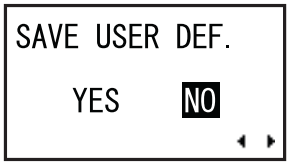


SAVE USER DEF.

This is a screen for saving service mode and advanced mode settings performed by the user as default settings.

- **YES**: Save the printer settings.
- **NO**: Do not save the printer settings.

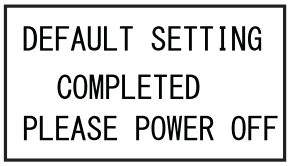
Note
The printer can be initialized to this setting at a later time. Refer to **Section 4.2.18 Default Setting Mode**.



DEFAULT SETTING COMPLETED

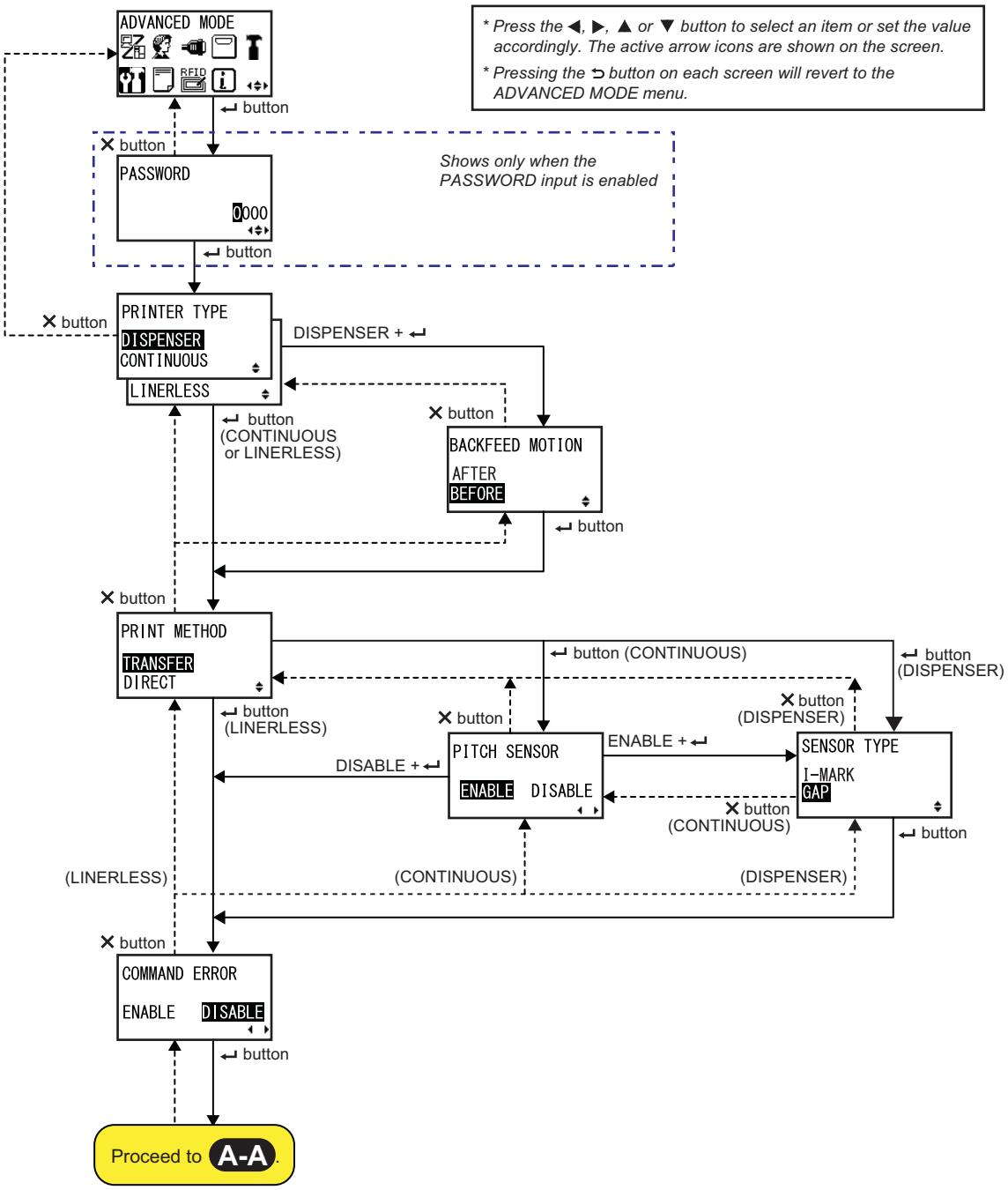
Shows when the printer settings have been saved completely.

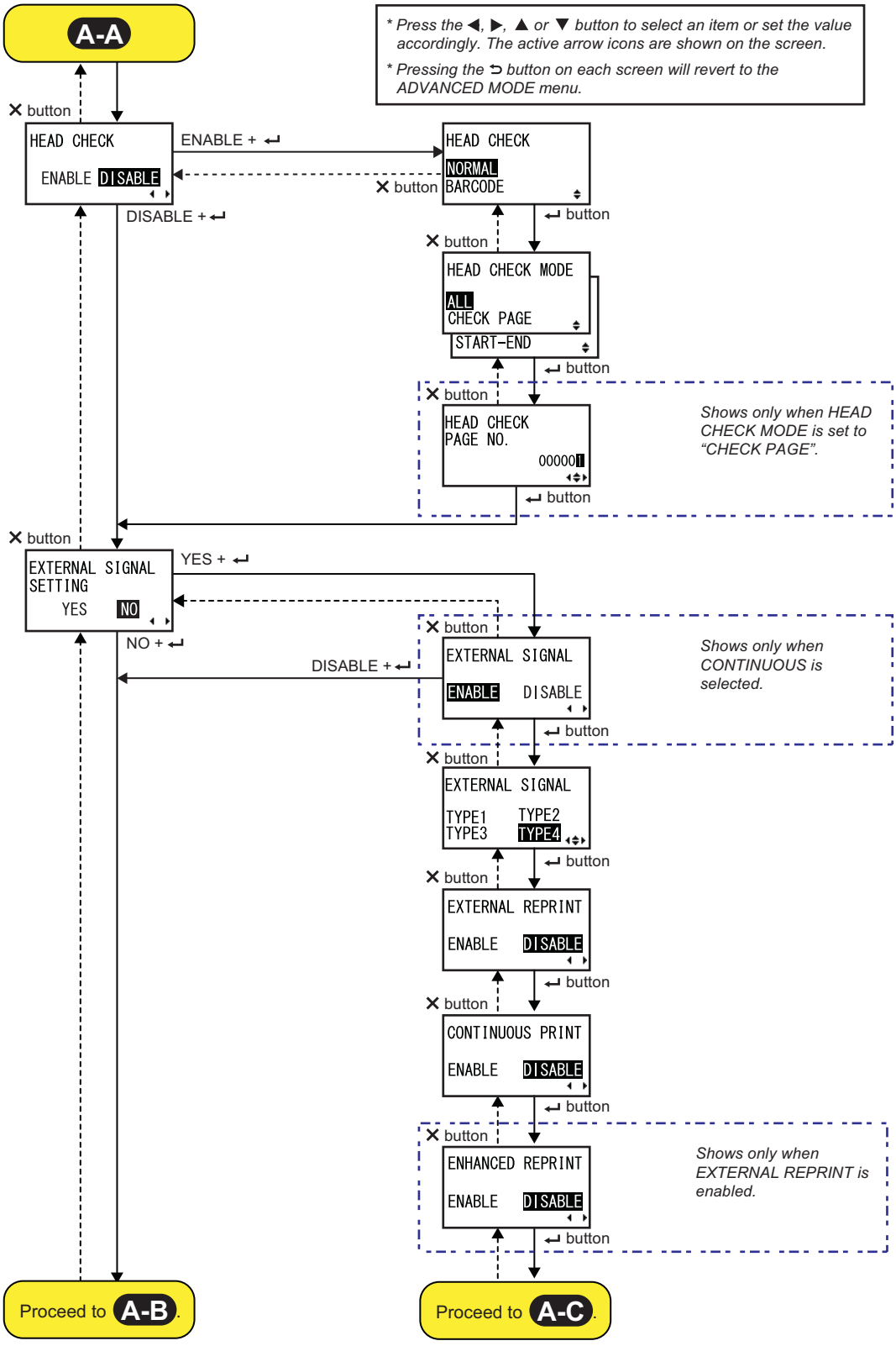
Note
The setting will be effective only if you power on the printer again.

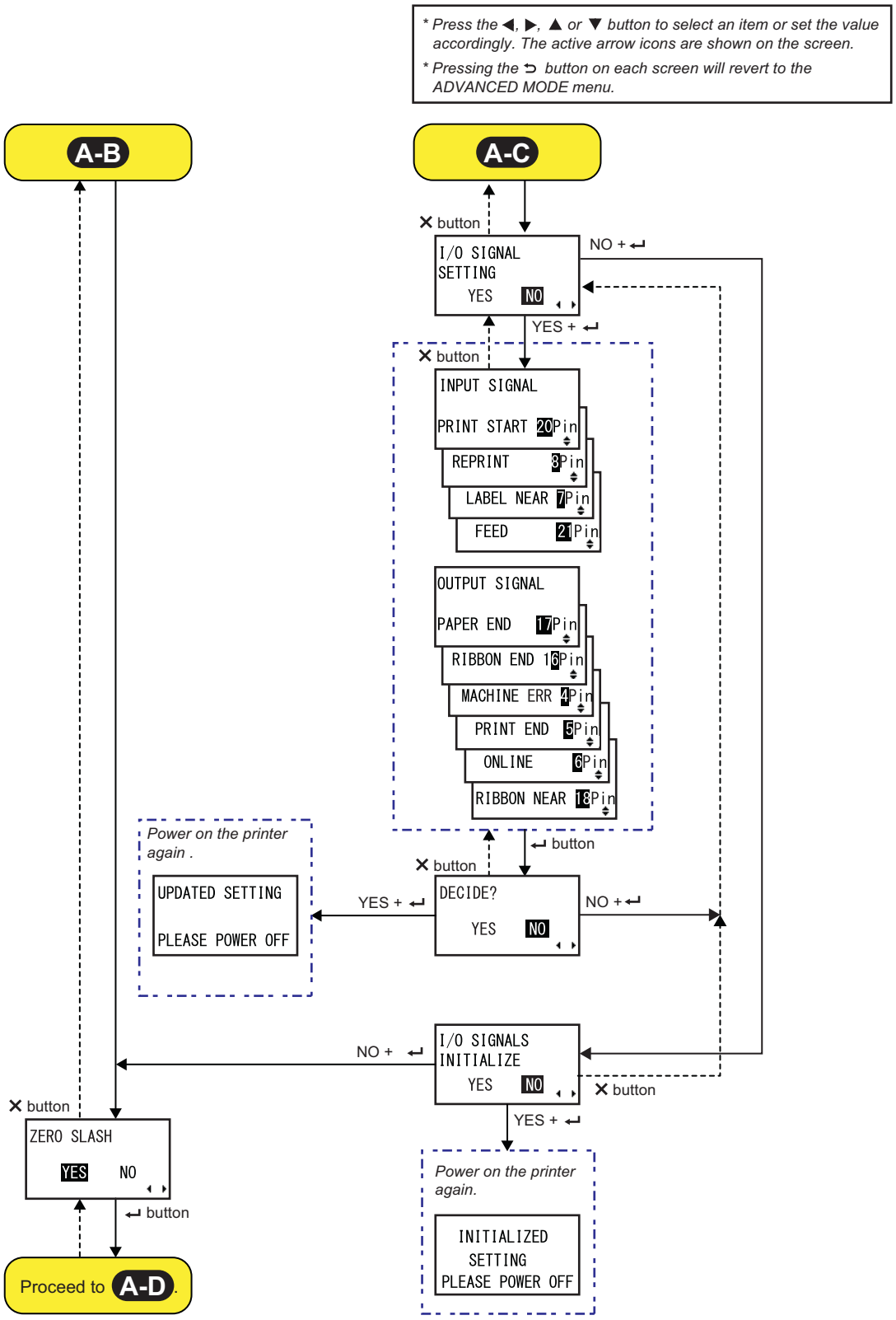


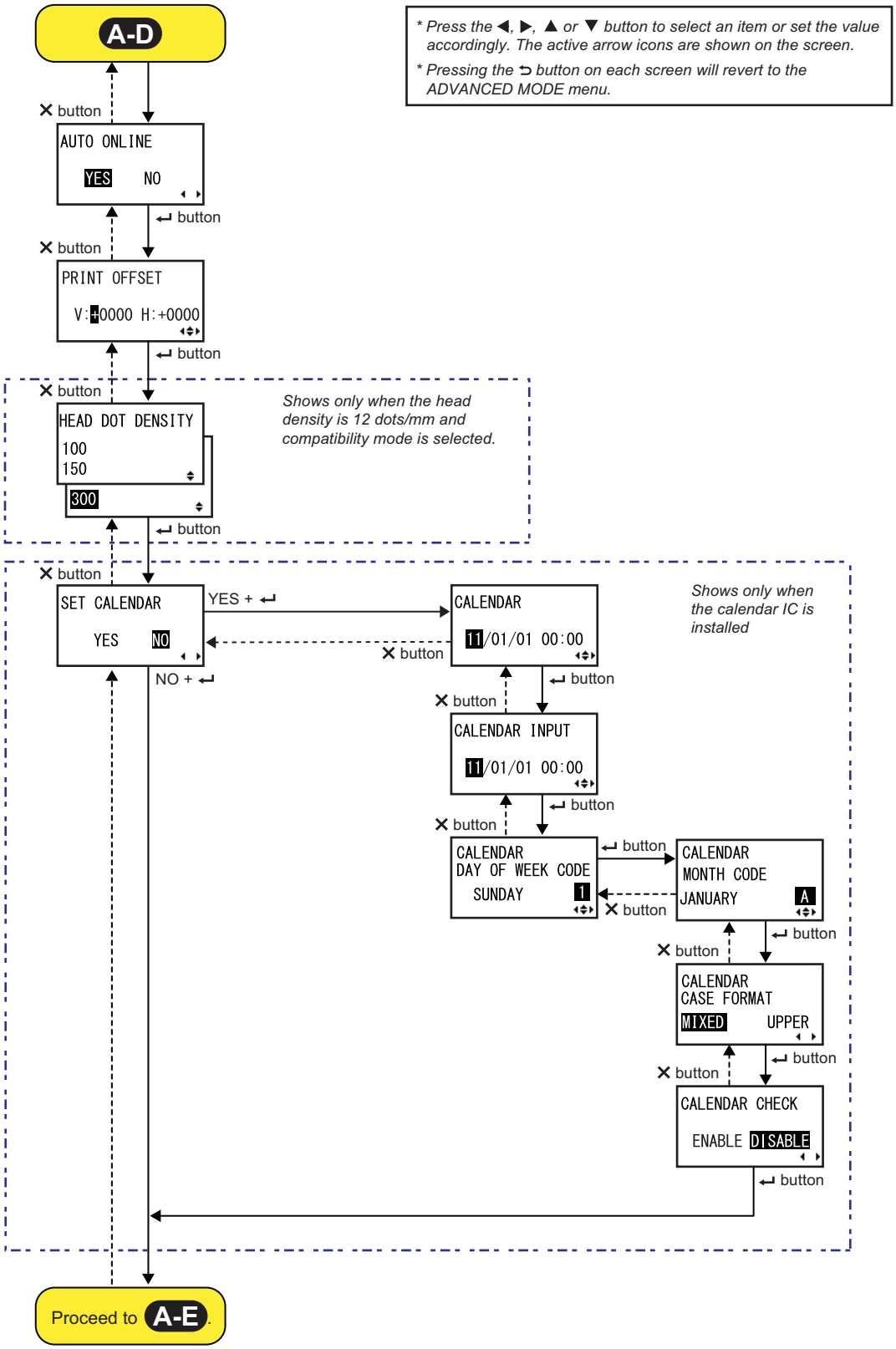
4.2.13 Advanced Mode

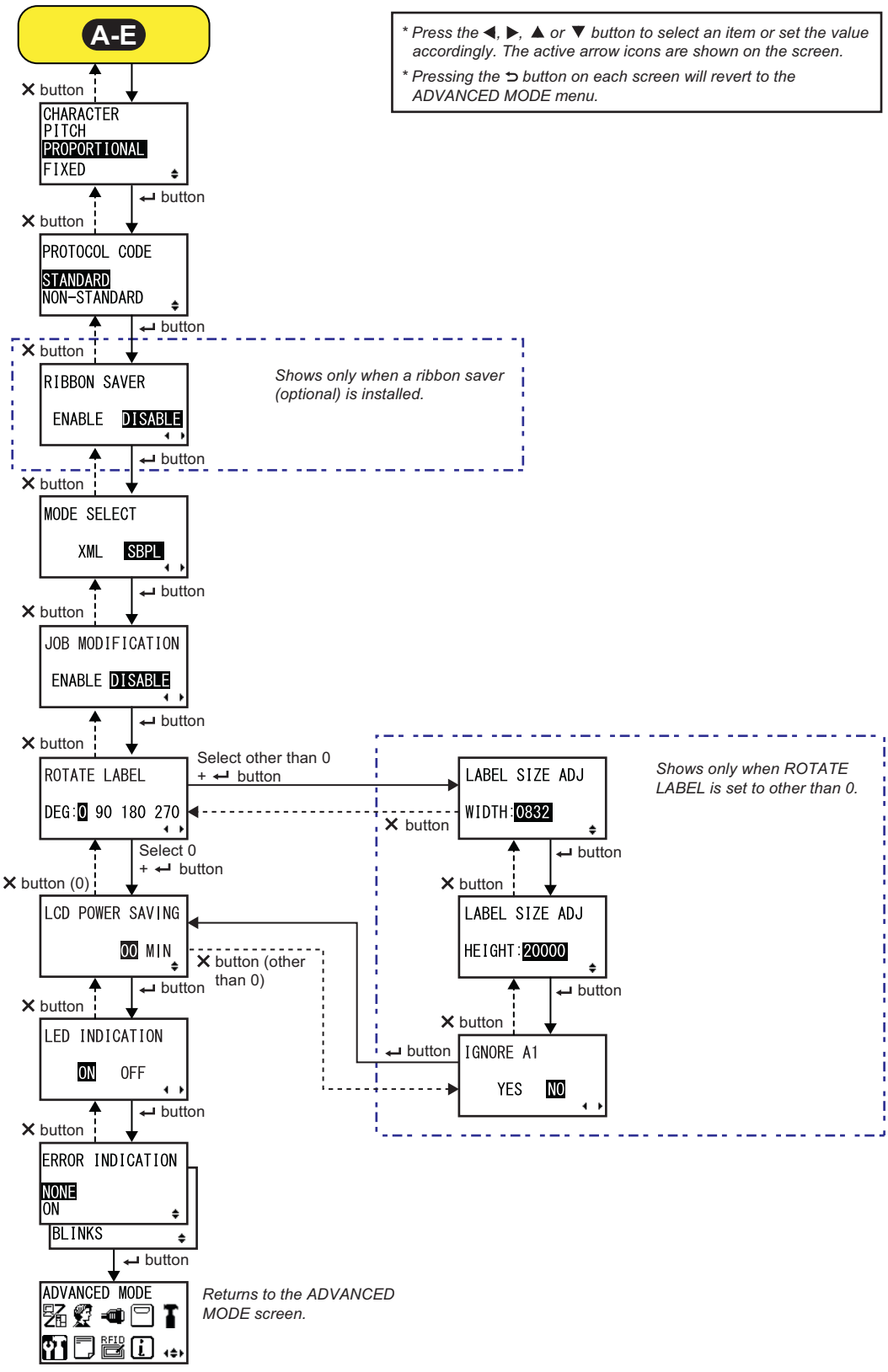
The advanced mode lets you configure the more advanced features of the printer hardware.
The flowchart shows the sequence of the setting screens for the advanced mode. The table describes each setting screen in detail.




A-A
* Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
* Pressing the ⮌ button on each screen will revert to the ADVANCED MODE menu.
✕ button
HEAD CHECK
ENABLE DISABLE
ENABLE + ↵
DISABLE + ↵
HEAD CHECK
NORMAL
BARCODE
✕ button
↵ button
HEAD CHECK MODE
ALL
CHECK PAGE
START-END
HEAD CHECK
PAGE NO.
00000
Shows only when HEAD CHECK MODE is set to "CHECK PAGE".
EXTERNAL SIGNAL
SETTING
YES NO
YES + ↵
NO + ↵
EXTERNAL SIGNAL
ENABLE DISABLE
DISABLE + ↵
Shows only when CONTINUOUS is selected.
EXTERNAL SIGNAL
TYPE1 TYPE2
TYPE3 TYPE4
EXTERNAL REPRINT
ENABLE DISABLE
CONTINUOUS PRINT
ENABLE DISABLE
ENHANCED REPRINT
ENABLE DISABLE
Shows only when EXTERNAL REPRINT is enabled.
Proceed to A-B.
Proceed to A-C.


* Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
* Pressing the ⮌ button on each screen will revert to the ADVANCED MODE menu.
A-B
A-C
✕ button
I/O SIGNAL SETTING
YES NO
NO + ↵
YES + ↵
✕ button
INPUT SIGNAL
PRINT START 20Pin
REPRINT 3Pin
LABEL NEAR 7Pin
FEED 21Pin
OUTPUT SIGNAL
PAPER END 17Pin
RIBBON END 16Pin
MACHINE ERR 4Pin
PRINT END 5Pin
ONLINE 6Pin
RIBBON NEAR 18Pin
↵ button
✕ button
DECIDE?
YES NO
YES + ↵
NO + ↵
Power on the printer again .
UPDATED SETTING
PLEASE POWER OFF
NO + ↵
I/O SIGNALS INITIALIZE
YES NO
✕ button
YES + ↵
Power on the printer again.
INITIALIZED SETTING
PLEASE POWER OFF
✕ button
ZERO SLASH
YES NO
↵ button
Proceed to A-D.

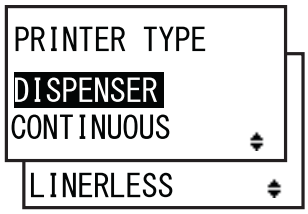

A-D
* Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
* Pressing the ⮌ button on each screen will revert to the ADVANCED MODE menu.
✕ button
AUTO ONLINE
YES NO
↵ button
PRINT OFFSET
V:+0000 H:+0000
HEAD DOT DENSITY
100
150
300
Shows only when the head density is 12 dots/mm and compatibility mode is selected.
SET CALENDAR
YES NO
YES + ↵
NO + ↵
CALENDAR
11/01/01 00:00
CALENDAR INPUT
11/01/01 00:00
CALENDAR
DAY OF WEEK CODE
SUNDAY 1
CALENDAR
MONTH CODE
JANUARY A
CALENDAR
CASE FORMAT
MIXED UPPER
CALENDAR CHECK
ENABLE DISABLE
Shows only when the calendar IC is installed
Proceed to A-E.


A-E
* Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
* Pressing the ⮌ button on each screen will revert to the ADVANCED MODE menu.
✕ button
CHARACTER PITCH
PROPORTIONAL
FIXED
↵ button
PROTOCOL CODE
STANDARD
NON-STANDARD
RIBBON SAVER
ENABLE DISABLE
Shows only when a ribbon saver (optional) is installed.
MODE SELECT
XML SBPL
JOB MODIFICATION
ENABLE DISABLE
ROTATE LABEL
DEG:0 90 180 270
Select other than 0 + ↵ button
LABEL SIZE ADJ
WIDTH:0832
Shows only when ROTATE LABEL is set to other than 0.
Select 0 + ↵ button
✕ button (0)
LCD POWER SAVING
00 MIN
✕ button (other than 0)
LABEL SIZE ADJ
HEIGHT:20000
LED INDICATION
ON OFF
IGNORE A1
YES NO
ERROR INDICATION
NONE
ON
BLINKS
ADVANCED MODE
RFID
Returns to the ADVANCED MODE screen.

PRINTER TYPE

Set the print mode.

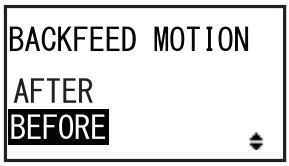
- **DISPENSER**: Peel the liner from the printed label as it is advanced to the printer's front. Once the printed label has been removed by the applicator, the next label will retract and position itself for printing.
- **CONTINUOUS**: Print the specified number of media. The media remains in position for printing at all times.
- **LINERLESS**: Perform backfeed, print and then feed each label to the applicator for cutting. You can specify the distance of FEED OFFSET and BACKFEED OFFSET in the SERVICE MODE menu.



BACKFEED MOTION

Backfeed is applicable only if the print mode is set to dispenser mode.

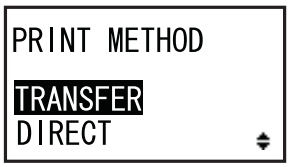
- **AFTER**: Backfeed the front part of the next label after dispensing the label.
- **BEFORE**: Before printing, backfeed the front part of the media to the print head position.



PRINT METHOD

Set the print method.

- **TRANSFER**: Print using a ribbon.
- **DIRECT**: Print using direct thermal paper.

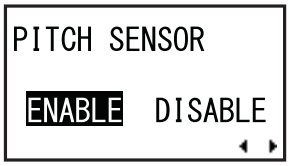


PITCH SENSOR

Enable or disable the pitch sensor.

- **ENABLE**: Enable the pitch sensor.
- **DISABLE**: Disable the pitch sensor.

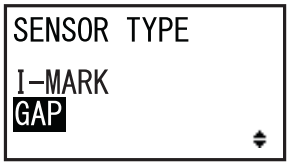
Note
Shows only if PRINTER TYPE is set to CONTINUOUS.



SENSOR TYPE

Set the type of sensor for sensing the media.

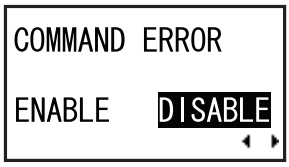
- **I-MARK**: Use the reflective type sensor.
- **GAP**: Use the transmissive type sensor.



COMMAND ERROR

Enable or disable the command error indication.
This setting determines the printer motion when detecting a command error.

- **ENABLE**: Stops printing when a command error occurs.
- **DISABLE**: Shows a warning icon and continues printing when a command error occurs.



HEAD CHECK

This printer can be set to check the print head when printing each media.

- **ENABLE**: Enable the head check function.
- **DISABLE**: Disable the head check function.



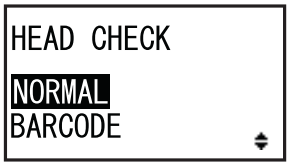
HEAD CHECK

Automatically check if there is a filament disconnection of the print head.

- **NORMAL**: Check the entire print area.
- **BARCODE**: Check only the area for printing a barcode. Head check is not applicable for barcodes printed as graphic data.

CAUTION
Head check is a reference for checking for a filament disconnection of the print head. This function does not guarantee barcode readability.

Note
Shows only if the head check function is enabled.

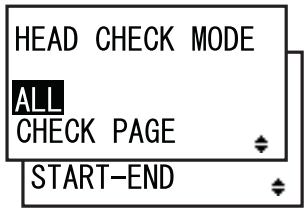


HEAD CHECK MODE

Set the method for the head check.

- **ALL**: Perform the head check for every item.
- **CHECK PAGE**: Perform the head check for each specified number of media.
- **START-END**: The head check occurs before starting to print and when printing is stopped. If backfeed is applicable, the head check occurs before starting to print, when stopping to print and during the backfeed.

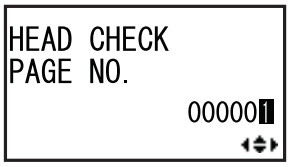
Note
Shows only if the head check function is enabled.



HEAD CHECK PAGE NO.

Specify the number of media between each head check.
The setting range is from 000001 to 999999.

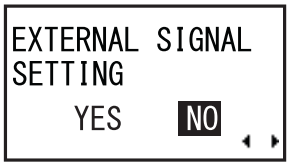
Note
Shows only if HEAD CHECK MODE is set to CHECK PAGE.



EXTERNAL SIGNAL SETTING

Select whether or not to perform the external signal setting.

- **YES**: Proceed to the external signal setting screen.
- **NO**: Proceed to the ZERO SLASH screen.



EXTERNAL SIGNAL

Enable or disable the external signal (EXT) function.

- **ENABLE**: Enable the external signal (EXT) function.
- **DISABLE**: Disable the external signal (EXT) function.

Note
Shows only if PRINTER TYPE is set to CONTINUOUS.

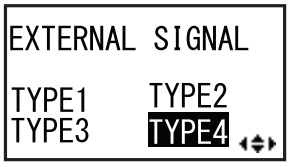


EXTERNAL SIGNAL

Set the output signal type of the print end signal (PREND).
The following options are available:

Type	Operation Details
TYPE1	The print end signal (PREND) is High before label printing, and it becomes Low after print completion. The signal level becomes High after 20 ms.
TYPE2	The print end signal (PREND) is Low before label printing, and it becomes High after print completion. The signal level becomes Low after 20 ms.
TYPE3	The print end signal (PREND) is High before label printing, becomes Low from the start to the end of print, and becomes High again after print completion.
TYPE4	The print end signal (PREND) is Low before label printing, becomes High from the start to the end of print, and becomes Low again after print completion.

Note
- Shows only if the external signal (EXT) function is enabled.
- Refer to the **Timing Chart of the EXT Input Signal** for details.

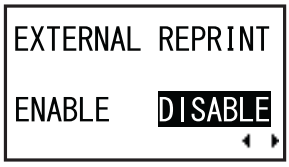


EXTERNAL REPRINT

Set the reprint function by reprint signal from the external signal.

- **ENABLE**: Enable the reprint.
- **DISABLE**: Disable the reprint.

Note
The printer will not reprint if a command error occurs.



CONTINUOUS PRINT

Set the reprint function by the print start signal from an external signal.

- **ENABLE**: Enable the continuous print.
- **DISABLE**: Disable the continuous print.

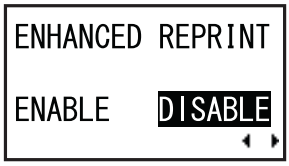


ENHANCED REPRINT

Set the reprint function by the reprint signal from an external signal.

- **ENABLE**: The printer reprints regardless of the remaining print quantity.
- **DISABLE**: Disable the enhanced reprint.

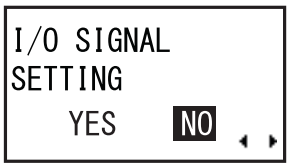
Note
Shows only if EXTERNAL REPRINT is enabled.



I/O SIGNAL SETTING

Select whether or not to set the pin number for the input/output signal.

- **YES**: Proceed to the INPUT SIGNAL screen.
- **NO**: Proceed to the I/O SIGNALS INITIALIZE screen.

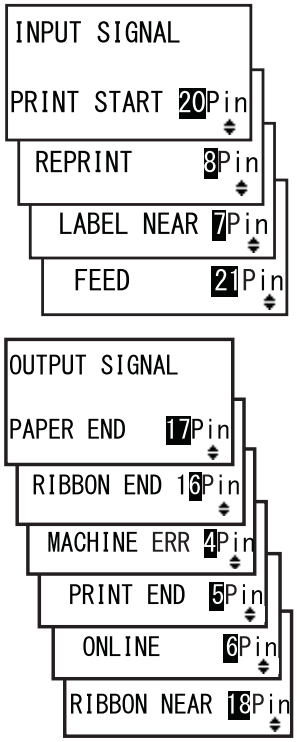


INPUT SIGNAL/OUTPUT SIGNAL

Set the pin number for the input/output signal.
The setting details are as follows:

Signal Name	Input/ Output	Default Pin No.	Overlapping	Available Pin No.
PRINT START	Input	20	Not Allowed	Can be set to 8 or 20.
REPRINT	Input	8	Not Allowed	
LABEL NEAR END	Input	7	Not Allowed	Can be set to 7 or 21. "-": Function is disabled.
FEED	Input	21	Not Allowed	
PAPER END	Output	17	Allowed	Can be set to 4, 5, 6, 16, 17 or 18. "-": No output
RIBBON END	Output	16	Allowed	
MACHINE ERROR	Output	4	Allowed	
PRINT END	Output	5	Not Allowed	
ONLINE	Output	6	Allowed	
RIBBON NEAR END	Output	18	Allowed	

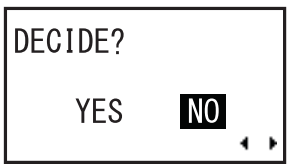
Note
For details, refer to **Section 8.5 Input/Output Signal of the External Signal**.



DECIDE?

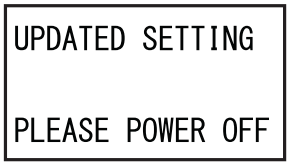
Select whether or not to confirm the input/output signal setting.

- **YES**: Proceed to the UPDATED SETTING screen.
- **NO**: Returns to the I/O SIGNAL SETTING screen.



UPDATED SETTING

This screen shows that the input/output signal setting has been updated.
Power on the printer again to make the setting effective.

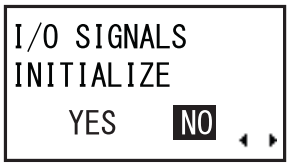


I/O SIGNALS INITIALIZE

Select whether or not to initialize the pin number for the input/output signal.

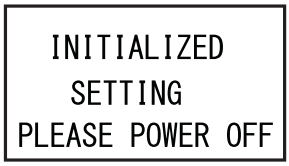
- **YES**: Proceed to the INITIALIZED SETTING screen.
- **NO**: Proceed to the ZERO SLASH screen.

Note
Refer to the default value of the pin number in **INPUT SIGNAL/OUTPUT SIGNAL**.



INITIALIZED SETTING

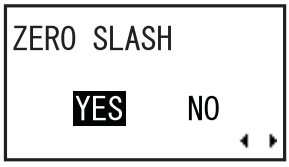
This screen shows that the pin number for the input/output signal has been initialized.
Power on the printer again to make the setting effective.



ZERO SLASH

Set whether to print the number zero (0) with or without a slash (/).

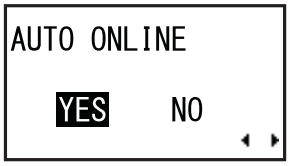
- **YES**: Print zero with a slash.
- **NO**: Print zero without a slash.



AUTO ONLINE

Set the auto online function.
This function sets the printer status at power on.

- **YES**: Start up the printer in online mode.
- **NO**: Start up the printer in offline mode.

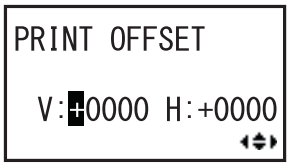


PRINT OFFSET

When setting the print position in the vertical direction “V”:
Set the offset value with ‘+’ from the print reference position to move the print position opposite the feed direction and value with '-' to move the print position in the feed direction.

When setting the print position in the horizontal direction “H”:
Set the offset value with '+' from the print reference position to move to the left side and value with '-' to move to the right side of the printer (when facing the front of the printer).
The setting range varies depending on the model as follows:

Model	V (dot)	H (dot)
S84-ex (203 dpi)	±0-9999	±0-832
S84-ex (305 dpi)	±0-9999	±0-1248
S84-ex (609 dpi)	±0-9999	±0-2496
S86-ex (203 dpi)	±0-9999	±0-1340
S86-ex (305 dpi)	±0-9999	±0-2010

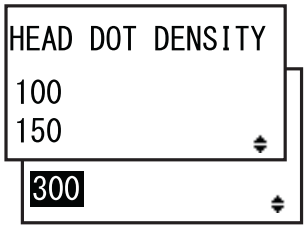


HEAD DOT DENSITY

Toggle the head dot density from 12 dots/mm to 6 dots/mm and vice versa.
The following options are available:

- **100**: Approximately four inches. Effective for S84-ex only.
- **150**: Approximately six inches. Effective for S84-ex and S86-ex.
- **300**: Approximately twelve inches. Effective for S84-ex and S86-ex.

Note
Shows only if the head dot density is 12 dots/mm and **COMPATIBLE MODE** is enabled. For details on the compatible mode, refer to **Section 8.3 About Compatible Mode**.

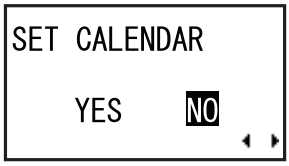


SET CALENDAR

Select whether or not to set the calendar.

- **YES**: Proceed to the calendar setting screen.
- **NO**: Proceed to the CHARACTER PITCH screen.

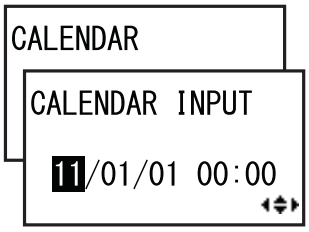
Note
Shows only if the calendar IC is installed.



CALENDAR/CALENDAR INPUT

Set the Year/Month/Date and then set the time in 24 hour format.
Enter the date and time twice. When the entered value of both screens match, it goes to the next screen after saving the value. If not, the printer beeps and returns to the first entry screen. The second entry is indicated as CALENDAR INPUT on the screen.
The setting range is from 81/01/01 00:00 (January 01, 1981 at 00:00) to 80/12/31 0:00 (December 31, 2080 at 00:00).

Note
Shows only if YES is selected in the SET CALENDAR screen.

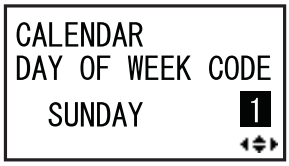


CALENDAR DAY OF WEEK CODE

Set the day of the week code for the calendar.
The setting range is from 0 to 9, A to Z, and a to z.
The default value is 1-SUNDAY, 2-MONDAY, 3-TUESDAY, 4-WEDNESDAY, 5-THURSDAY, 6-FRIDAY, 7-SATURDAY.

Select the day using the ▲/▼ buttons, select the day of the week code using the ◀/▶ buttons, then press the ↵ **ENTER** button to confirm the day of week code.

Note
Shows only if YES is selected in the SET CALENDAR screen.

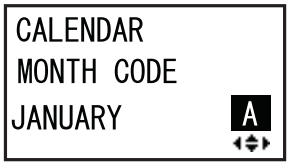


CALENDAR MONTH CODE

Set the month code for the calendar.
The setting range is from A to Z and a to z.
The default value is A-JANUARY, B-FEBRUARY, C-MARCH, D-APRIL, E-MAY, F-JUNE, G-JULY, H-AUGUST, J-SEPTEMBER, K-OCTOBER, L-NOVEMBER, M-DECEMBER.

Select the month using the ▲/▼ buttons, select the month code using the ◀/▶ buttons, then press the ↵ **ENTER** button to confirm the month code.

Note
Shows only if YES is selected in the SET CALENDAR screen.

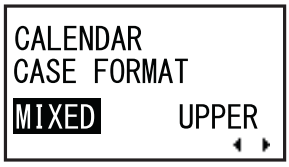


CALENDAR CASE FORMAT

Select the character format for the calendar.

- **MIXED**: Use upper case for the first character only.
- **UPPER**: Use upper case for all characters.

Note
Shows only if YES is selected in the SET CALENDAR screen.

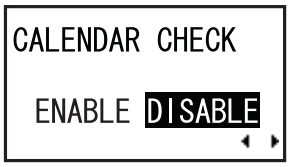


CALENDAR CHECK

Enable or disable the calendar check function.

- **ENABLE**: Enable the calendar check function.
- **DISABLE**: Disable the calendar check function.

Note
Shows only if YES is selected in the SET CALENDAR screen.



CHARACTER PITCH

Set the character width for printing.

- **PROPORTIONAL**: Print each character with a different width.
- **FIXED**: Print all characters with the same width.

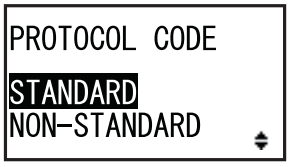


PROTOCOL CODE

Set the protocol code.

- **STANDARD**: Use a standard code.
- **NON-STANDARD**: Use a non-standard code.

Note
To set the non-standard code, send the user download command <LD> in normal mode. For more details on the <LD> command, refer to the Programming Reference.

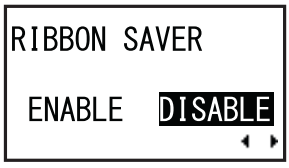


RIBBON SAVER

Enable or disable the ribbon saver function.

- **ENABLE**: Use the ribbon saver.
- **DISABLE**: Do not use the ribbon saver.

Note
Shows only if the optional ribbon saver is installed. The optional ribbon saver is only available for the S84-ex printer.
For details on the ribbon saver function, refer to **Section 8.10 Optional Ribbon Saver**.



MODE SELECT

Set the communication command mode for analysis.

- **XML**: Use for supporting Oracle and SAP mode.
- **SBPL**: Use SBPL (SATO Barcode Printer Language) for the printer commands.

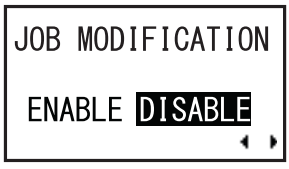
Note
The setting will be effective only if you power on the printer again.



JOB MODIFICATION

Set the job modification function.
Use the job modification command <#J> to specify the strings before and after conversion.

- **ENABLE**: Enable the job modification function.
- **DISABLE**: Disable the job modification function.



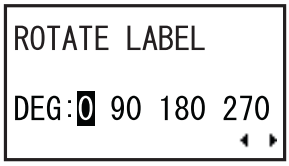
ROTATE LABEL

Set the rotation for printing.

- **0**: Print the data as usual without rotation.
- **90**: Print the data with 90 degree counterclockwise rotation from media feed direction.
- **180**: Print the data with 180 degree counterclockwise rotation from media feed direction.
- **270**: Print the data with 270 degree counterclockwise rotation from media feed direction.

Note

The LABEL SIZE ADJ screen shows if you press the ↵ **ENTER** button with 90, 180 or 270 selected.



LABEL SIZE ADJ WIDTH

Specify the width of the label for rotation.
The setting range varies depending on the model as follows:

Model	Setting Range (dot)	Default Value (dot)	Step
S84-ex (203 dpi)	0000-0832	0832	8
S84-ex (305 dpi)	0000-1248	1248	12
S84-ex (609 dpi)	0000-2496	2496	24
S86-ex (203 dpi)	0000-1340	1340	8
S86-ex (305 dpi)	0000-2010	2010	12

Note

Shows only if ROTATE LABEL is set to 90, 180 or 270.

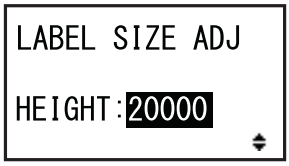


LABEL SIZE ADJ HEIGHT

Specify the height of the label for rotation.
The setting range varies depending on the model as follows:

Model	Setting Range (dot)	Default Value (dot)
S84-ex (203 dpi)	00000-20000	20000
S84-ex (305 dpi)	00000-18000	18000
S84-ex (609 dpi)	00000-09600	09600
S86-ex (203 dpi)	00000-09992	09992
S86-ex (305 dpi)	00000-14988	14988

Note
Shows only if ROTATE LABEL is set to 90, 180 or 270.

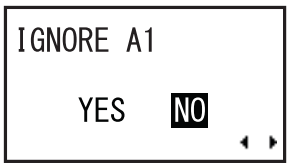


IGNORE A1

Select whether or not to ignore the <A1> command.
<A1> command is to set the media size.
Refer to the Programming Reference for details of the command.

- **YES**: Ignore the <A1> command.
- **NO**: Proceed with the <A1> command.

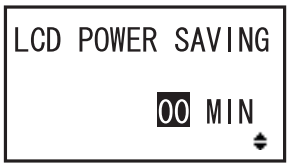
Note
Shows only if ROTATE LABEL is set to 90, 180 or 270.



LCD POWER SAVING

Specify a period of time to light off the LCD backlight when the printer is not operated.
The setting range is from 00 to 15 minutes.

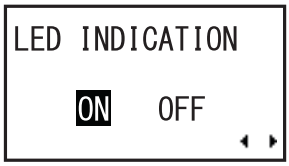
Note
This function is disabled if set to 00; the LCD backlight will remain on. For details, refer to **Section 8.4 LCD Power Saving Mode**.



LED INDICATION

Set the LED indicator for indicating the printer status.

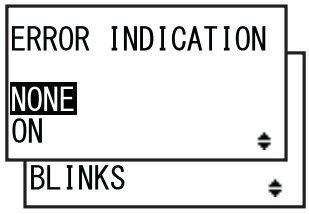
- **ON**: The LED indicator lights, flashes or off according to the printer status.
- **OFF**: The LED indicator is always off.



ERROR INDICATION

Set the LCD backlight for indicating a printer error.

- **NONE**: No change to the LCD backlight.
- **ON**: The LCD backlight lights orange.
- **BLINKS**: The LCD backlight flashes orange.

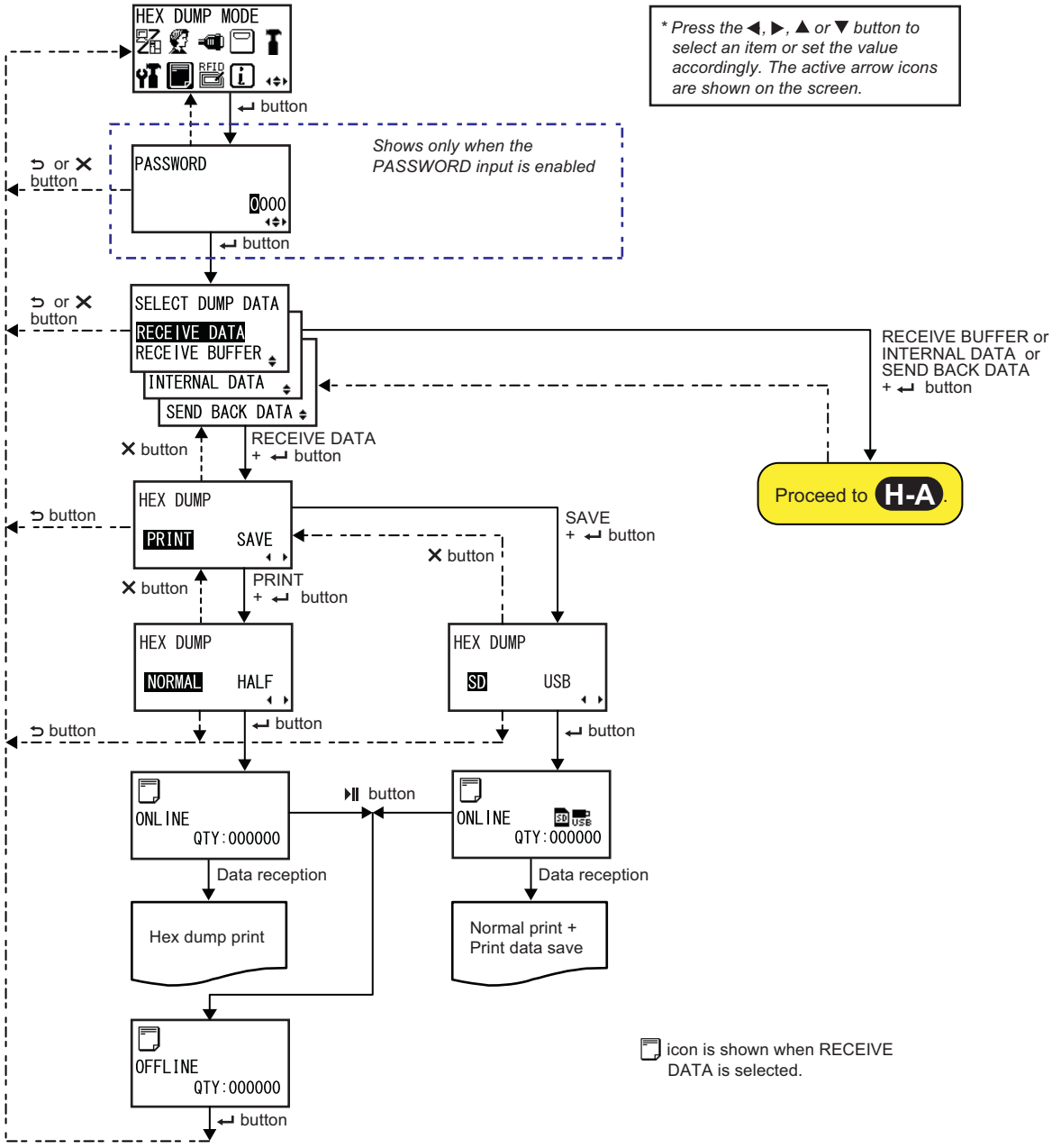


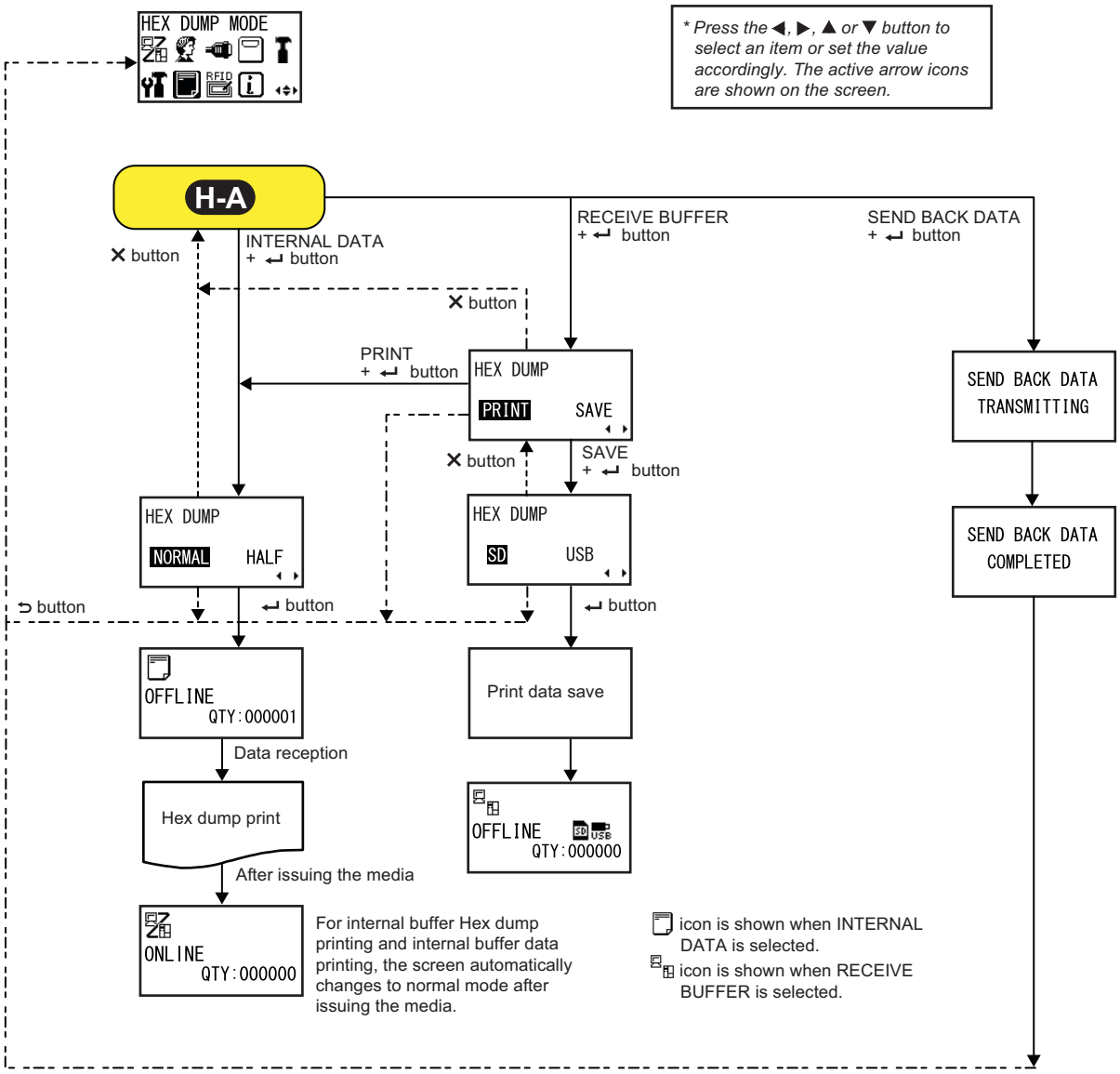
4.2.14 Hex Dump Mode

The hex dump mode allows you to print the contents of the receive buffer in a hexadecimal format to allow the data stream to be examined for errors and troubleshooting.
The flowchart shows the sequence of the setting screens for the hex dump mode. The table describes each setting screen in detail.

⚠ CAUTION

Be sure to perform a virus check for the USB memory or SD card before connecting it to the printer. SATO Corporation shall not be held responsible for a malfunction of the printer caused by a virus infection through the USB memory or SD card.



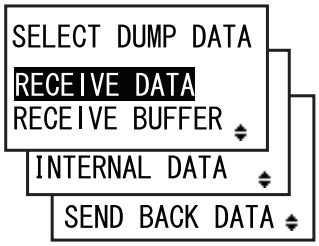

HEX DUMP MODE
* Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
H-A
INTERNAL DATA + ↵ button
✕ button
RECEIVE BUFFER + ↵ button
SEND BACK DATA + ↵ button
PRINT + ↵ button
HEX DUMP
PRINT SAVE
SAVE + ↵ button
SEND BACK DATA TRANSMITTING
SEND BACK DATA COMPLETED
HEX DUMP
NORMAL HALF
HEX DUMP
SD USB
⮌ button
↵ button
OFFLINE
QTY:000001
Data reception
Hex dump print
After issuing the media
ONLINE
QTY:000000
Print data save
OFFLINE
QTY:000000
For internal buffer Hex dump printing and internal buffer data printing, the screen automatically changes to normal mode after issuing the media.
icon is shown when INTERNAL DATA is selected.
icon is shown when RECEIVE BUFFER is selected.

SELECT DUMP DATA

Select the data for printing the hex dump.

- **RECEIVE DATA**: Print the hex dump of the received data.
- **RECEIVE BUFFER**: Print the hex dump of the received print data (one item).
- **INTERNAL DATA**: Print the setting values of the internal buffer.
- **SEND BACK DATA**: Return the received data (one item) to the data port.

Note
RECEIVE BUFFER and SEND BACK DATA cannot be selected if there is no received data.



HEX DUMP

Set the print and save functions of the hex dump.

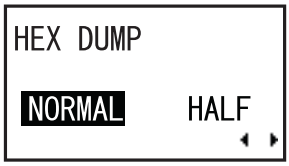
- **PRINT**: Only print the received data.
- **SAVE**: Save and print the received data.



HEX DUMP

Set the print width of the hex dump.

- **NORMAL**: Print the received data with sixteen bytes in one line.
- **HALF**: Print the received data with eight bytes in one line.



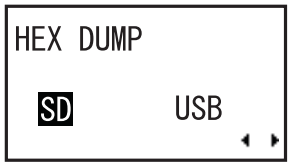
HEX DUMP

Set the memory for saving the hex dump data.
The file name of the data to be saved is created from “DATA_001.DAT” in sequence.
A maximum of one hundred hex dump data can be saved.
When saving file with one hundred files already in the media, the older file starting from the first number (001) will be overwritten in sequence.

- **SD**: Save data to an SD card.
- **USB**: Save data to a USB memory.

Note

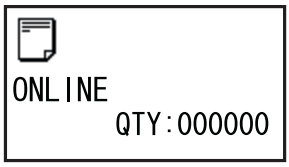
- For installation and removal of the memory, refer to **Section 2.8 Installing Optional Memory Storage**.
- Three beeps will sound if you press the ↵ **ENTER** button when the selected memory is not installed.



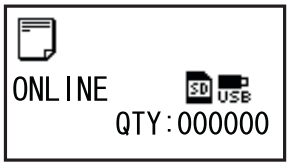
ONLINE

This screen shows an online status icon if RECEIVE DATA is selected.

HEX DUMP PRINT

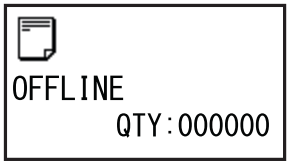


HEX DUMP SAVE



OFFLINE

This screen shows an offline status icon if RECEIVE DATA or INTERNAL DATA is selected.



ONLINE	
This screen shows an online status icon if INTERNAL DATA is selected.	

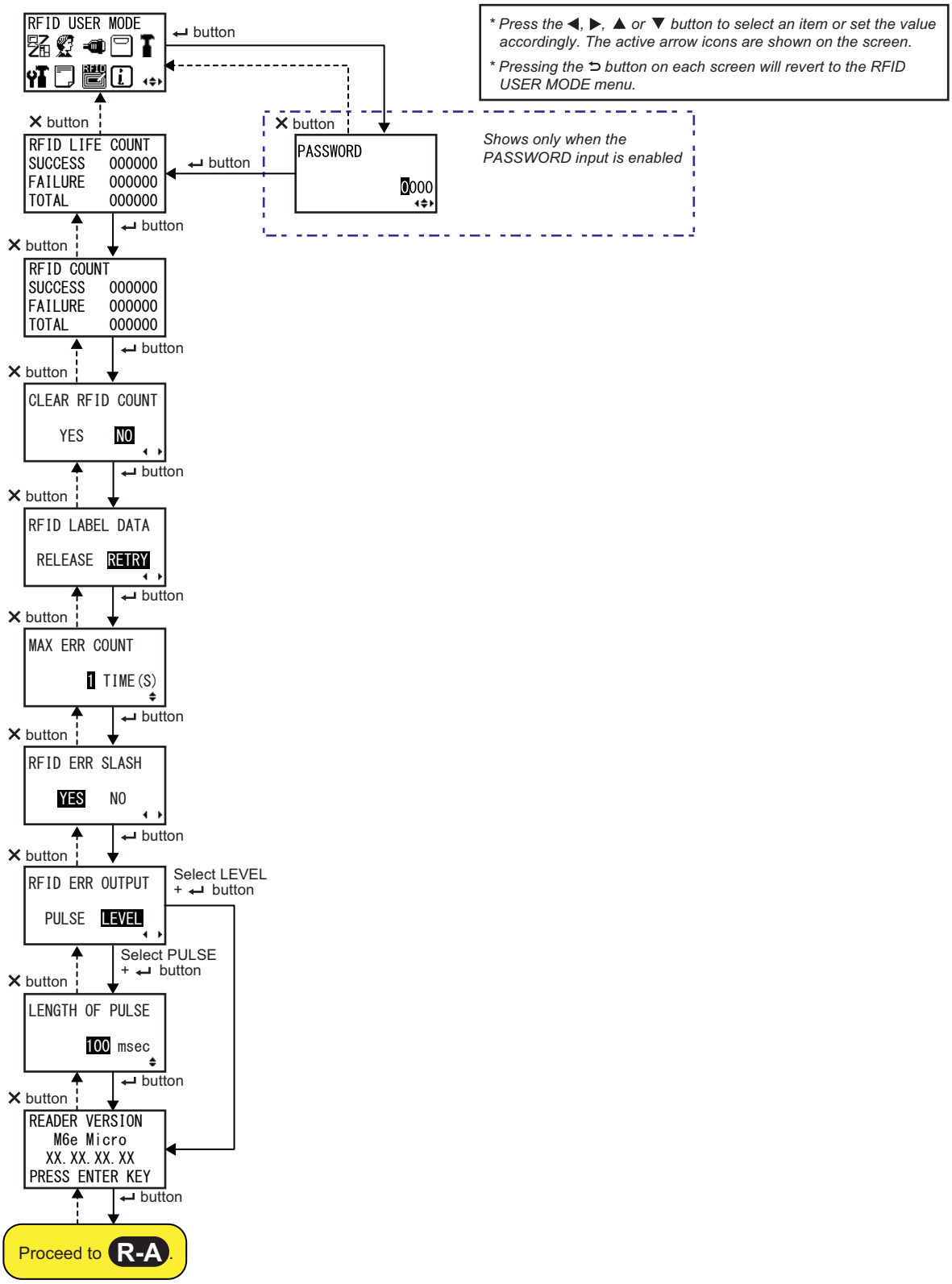
OFFLINE	
This screen shows an offline status icon if RECEIVE BUFFER is selected.	

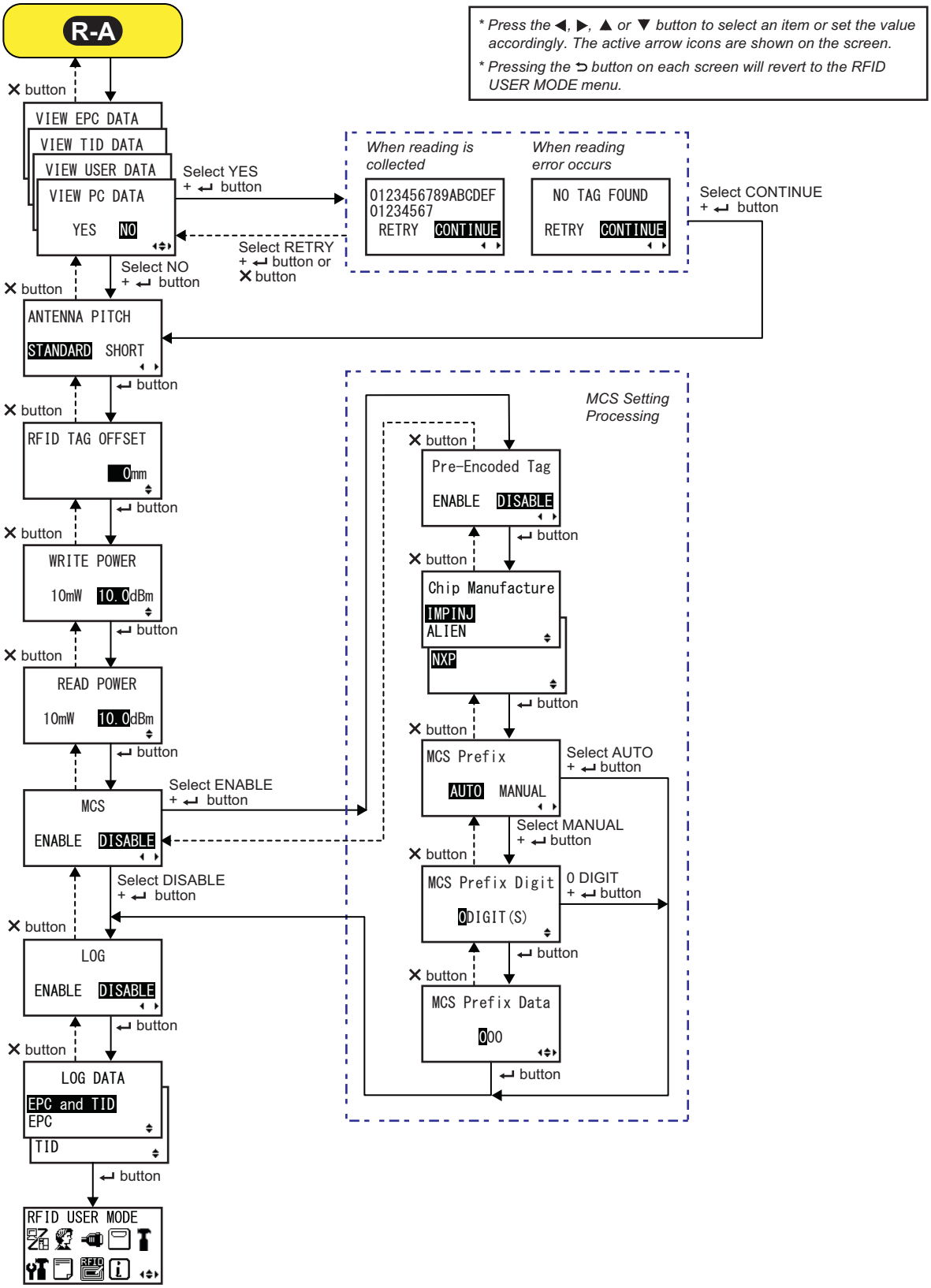
SEND BACK DATA TRANSMITTING	
This screen shows while the printer is transmitting the “SEND BACK DATA”.	

SEND BACK DATA COMPLETED	
This screen shows that the printer has completed the transmission of “SEND BACK DATA”. **Note** The printer returns to the HEX DUMP MODE screen after three beeps.	

4.2.15 RFID User Mode

The flowchart shows the sequence of the setting screens for the RFID user mode. The table describes each setting screen in detail.



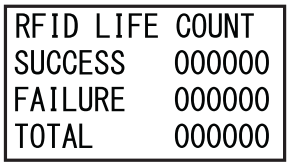

R-A
* Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
* Pressing the ⮌ button on each screen will revert to the RFID USER MODE menu.
✕ button
VIEW EPC DATA
VIEW TID DATA
VIEW USER DATA
VIEW PC DATA
YES NO
Select YES + ↵ button
Select NO + ↵ button
Select RETRY + ↵ button or ✕ button
When reading is collected
0123456789ABCDEF
01234567
RETRY CONTINUE
When reading error occurs
NO TAG FOUND
RETRY CONTINUE
Select CONTINUE + ↵ button
ANTENNA PITCH
STANDARD SHORT
↵ button
RFID TAG OFFSET
0mm
WRITE POWER
10mW 10.0dBm
READ POWER
10mW 10.0dBm
MCS
ENABLE DISABLE
Select ENABLE + ↵ button
Select DISABLE + ↵ button
LOG
ENABLE DISABLE
LOG DATA
EPC and TID
EPC
TID
RFID USER MODE
MCS Setting Processing
Pre-Encoded Tag
ENABLE DISABLE
Chip Manufacture
IMPINJ
ALIEN
NXP
MCS Prefix
AUTO MANUAL
Select AUTO + ↵ button
Select MANUAL + ↵ button
MCS Prefix Digit
0DIGIT(S)
0 DIGIT + ↵ button
MCS Prefix Data
000

RFID LIFE COUNT

This screen shows the total accumulated number of RFID write from the factory clear.

- **SUCCESS** shows the total number of write success.
- **FAILURE** shows the total number of write failure.
- **TOTAL** shows the total number of write success and write failure.

When the value of **TOTAL** exceeded 999999, all the values are cleared to 000000.

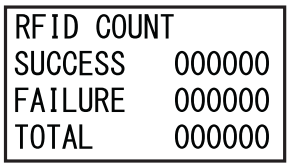


RFID COUNT

This screen shows the current RFID write numbers after the RFID counter is cleared.

- **SUCCESS** shows the number of write success.
- **FAILURE** shows the number of write failure.
- **TOTAL** shows the total number of write success and write failure.

When the value of **TOTAL** exceeded 999999, all the values are cleared to 000000.

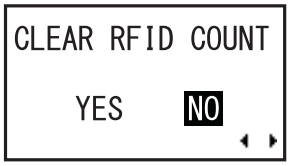


CLEAR RFID COUNT

Select whether or not to clear the current RFID counter.

- **YES**: Proceed to clear the RFID write numbers (SUCCESS, FAILURE and TOTAL).
- **NO**: Do not clear the RFID counter.

Note
The total accumulated number of RFID write in the RFID LIFE COUNT is not cleared.



RFID LABEL DATA

Set the recovery operation at RFID tag error, and recovery conditions at when the printer paused due to MAX ERR COUNT (number of retries) exceeding.
The options are as follows:

- **RELEASE**: When an RFID tag error occurs, the printer discards the current writing data and failed label. The RFID error screen shows and continues to print the next data. If the RFID error occurs continuously and reaches the specified MAX ERR COUNT, printing pauses.

  Press the ▶II **LINE** button to discard the current writing data and continues to the next print.

  Press the **FEED** button to discard the all data of the current item and continues to the next item printing.

  Press the ✕ **CANCEL** button to discard all the item data including the current data.
- **RETRY**: When an RFID tag error occurs, the printer attempts to write the same data based on the specified MAX ERR COUNT. If the tag error continues, an error message is shown and the printer pauses.

  Press the ▶II **LINE** button to print again.

  Press the **FEED** button to discard the data of the current item and continues to the next item printing.

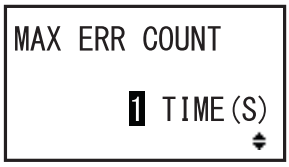
  Press the ✕ **CANCEL** button to discard all the item data including the current data.

If the external signal is enabled and MAX ERR COUNT is set to 0, the printer does not display the error message, nor pause at tag error with both RETRY/RELEASE, and continues printing with the external signal.



MAX ERR COUNT

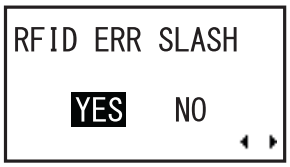
Set the number of retries (release/reprint) at the RFID tag error.
The count starts after the RFID tag error occurs.
The printer pauses with the error message when it has reached the specified number of errors.
The setting range is from 0 to 9.
If you set to 0, the RFID error screen shows and printing continues.



RFID ERR SLASH

Select whether or not to print a slash on a tag when an RFID tag error occurred.

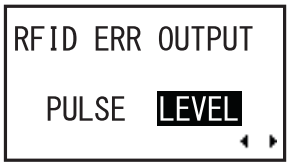
- **YES**: Prints a slash at the time of RFID tag error.
- **NO**: Do not print a slash at the time of RFID tag error. Only RFID TAG ERROR is printed.



RFID ERR OUTPUT

Set the output pattern at RFID error.

- **PULSE**: Single shot pulse output.
- **LEVEL**: Flat level output.

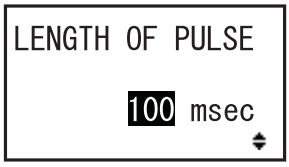


LENGTH OF PULSE

Set the pulse width.

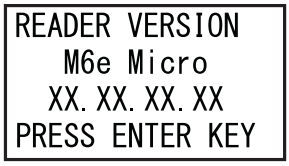
The setting range is from 100 to 500 msec.

Note
Shows only if PULSE is selected in the RFID ERR OUTPUT screen.



READER VERSION

This screen shows the firmware version of the RFID module.
This screen is not shown correctly when the RFID module is neither connected correctly nor configured correctly.

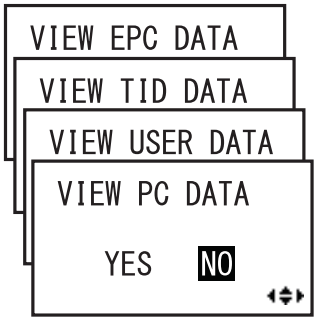


VIEW EPC DATA

Select whether or not to read and show the data of the RFID tag.
Tag needed to be set at the correct position (at antenna position) for correct reading.

Press the ▲/▼ buttons to select the reading area from EPC, TID, USER and PC.

- **YES**: The printer reads and shows the data.
- **NO**: Do not read the data and proceed to the next screen.

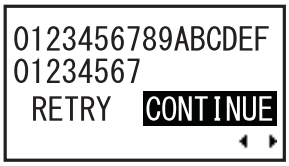


TAG DATA

This screen shows the data of the RFID tag.

If the read code is more than thirty-two digits, scroll using the ▲/▼ buttons to show the data.
If reading of the data is failed, NO TAG FOUND is shown.

- **RETRY**: Read the data again.
- **CONTINUE**: Proceed to the next screen.





ANTENNA PITCH

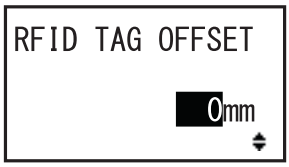
Set the antenna pitch.

- **STANDARD**
- **SHORT**



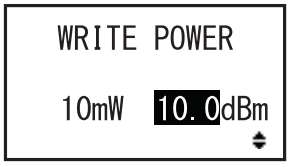
RFID TAG OFFSET

Set the value of the tag offset.
If the value is set to other than 0, tag writing is done during pause in printing.
The setting range is from 0 to 240 mm.
To release this function, set the value to 0 mm.



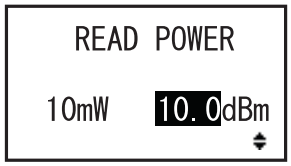
WRITE POWER

Set the write power of the antenna, referring to the “S84-ex UHF Inlay Placement & Configuration Table” in the S84-ex UHF RFID Configuration Guide.
The measurement unit is in dBm, and it is adjustable with 0.1 dBm.
The value converted to milliwatts (mW) is shown on the left.
The setting range differs according to the mounted RFID module.
The setting range is from 0.0 to 24.0 dBm.



READ POWER

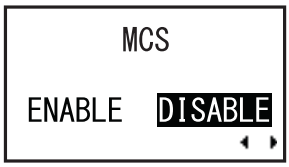
Set the read power of the antenna, referring to the “S84-ex UHF Inlay Placement & Configuration Table” in the S84-ex UHF RFID Configuration Guide.
The measurement unit is in dBm, and it is adjustable with 0.1 dBm.
The value converted to milliwatts (mW) is shown on the left.
The setting range differs according to the mounted RFID module.
The setting range is from 0.0 to 24.0 dBm.



MCS

Enable or disable the Multi vendor Chip-based Serialization.

- **ENABLE**: Enable the Multi vendor Chip-based Serialization.
- **DISABLE**: Disable the Multi vendor Chip-based Serialization.



LOG

Enable or disable the log function to record the RFID data.
The log data can record up to100 tags of information.

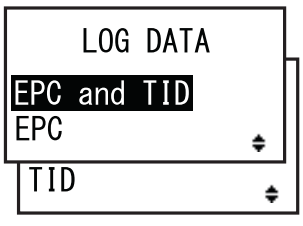
- **ENABLE**: Enable the log function to record the RFID data.
- **DISABLE**: Disable the log function to record the RFID data.



LOG Data

Set the data to be recorded in the log when LOG is enabled.

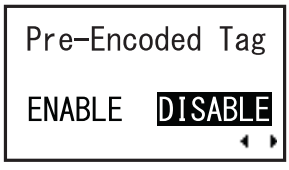
- **EPC and TID**: Store the EPC and TID data.
- **EPC**: Store the EPC data.
- **TID**: Store the TID data.



Pre-Encoded Tag

Enable or disable the pre-encoded tag.

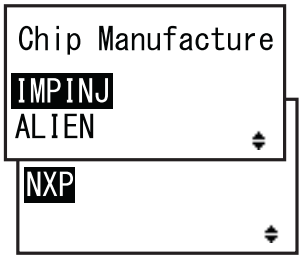
- **ENABLE**: Enable the pre-encoded tag.
- **DISABLE**: Disable the pre-encoded tag.



Chip Manufacture

Set the chip manufacturer of the RFID tag.

- **IMPINJ**
- **ALIEN**
- **NXP**



MCS Prefix

Set the MCS prefix insert method.

- **AUTO**: Set to the manufacturer prefix selected in Chip Manufacturer.
- **MANUAL**: Set to the prefix determined by the MCS Prefix Digit and MCS Prefix Data.

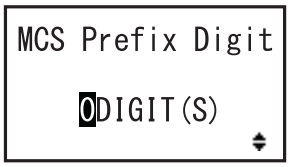


MCS Prefix Digit

Set the number of digits for the MCS prefix.

The setting range is from 0 to 3 digits.

Note
Shows only if MANUAL is selected in the MCS Prefix screen.



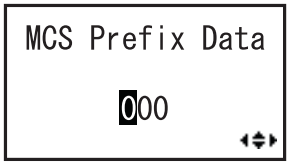
MCS Prefix Data

Set the MCS prefix data.

Number of digits to be input is according to the setting of the MCS Prefix Digit.

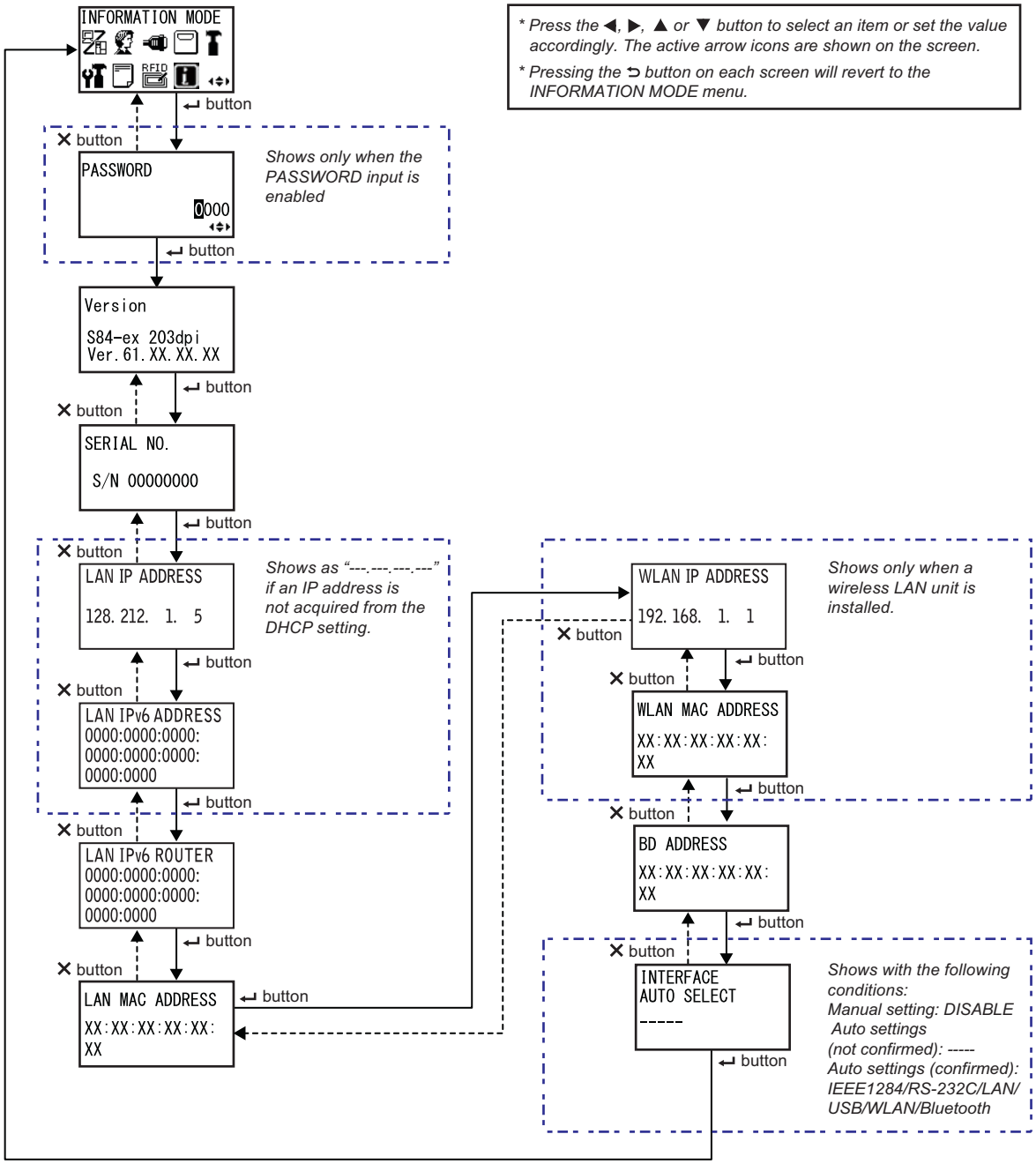
Note
Shows only if MANUAL is selected in the MCS Prefix screen.

When MCS Prefix Digit is set as 3DIGIT(S), the printer shows the screen as follow.



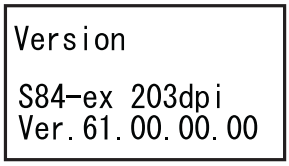
4.2.16 Information Mode

The flowchart shows the sequence of the setting screens for the information mode. The table describes each setting screen in detail.



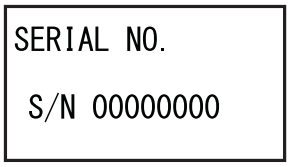
Version

Shows the model name and firmware version of this printer.



SERIAL NO.

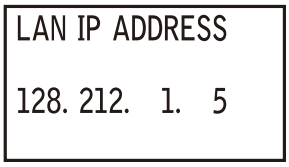
Shows the serial number of the control board in this printer.



LAN IPv4 ADDRESS

Shows the IPv4 address of the LAN.

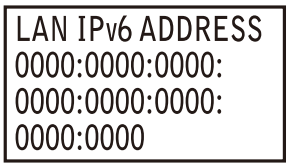
Note
If the IP address is not acquired from DHCP, it will be shown as "---.---.---.---".



LAN IPv6 ADDRESS

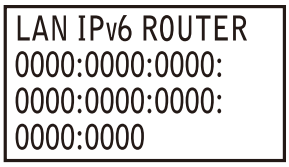
Shows the IPv6 address of the LAN.

Note
If the IP address is not acquired from DHCP, it will be shown as "----:----:----:----:----:----:----:----".



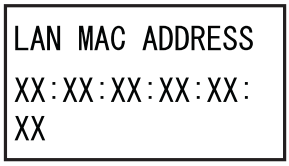
LAN IPv6 ROUTER

Shows the IPv6 router information for the LAN.



LAN MAC ADDRESS

Shows the MAC address of the LAN.

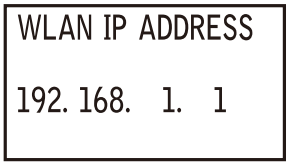


WLAN IP ADDRESS

Shows the IP address of the wireless LAN.

Note

- This screen shows only if a wireless LAN unit is installed.
- DHCP should be enabled to acquire the WLAN IP address.
- The IP address is shown as “---.---.---.---” before it is acquired.
- The dynamic IP address will be shown after it is acquired.
- When the printer fails to acquire the IP address or DHCP is disabled, the static IP address will be shown.

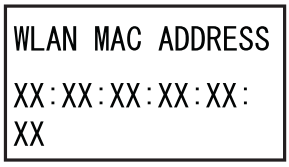


WLAN MAC ADDRESS

Shows the MAC address of the wireless LAN.

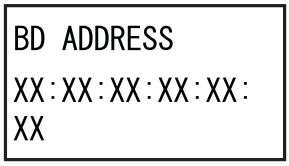
Note

This screen shows only if a wireless LAN unit is installed.



BD ADDRESS

Shows the BD address.

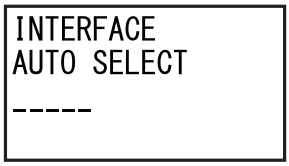


INTERFACE AUTO SELECT

Shows the interface auto detection status.

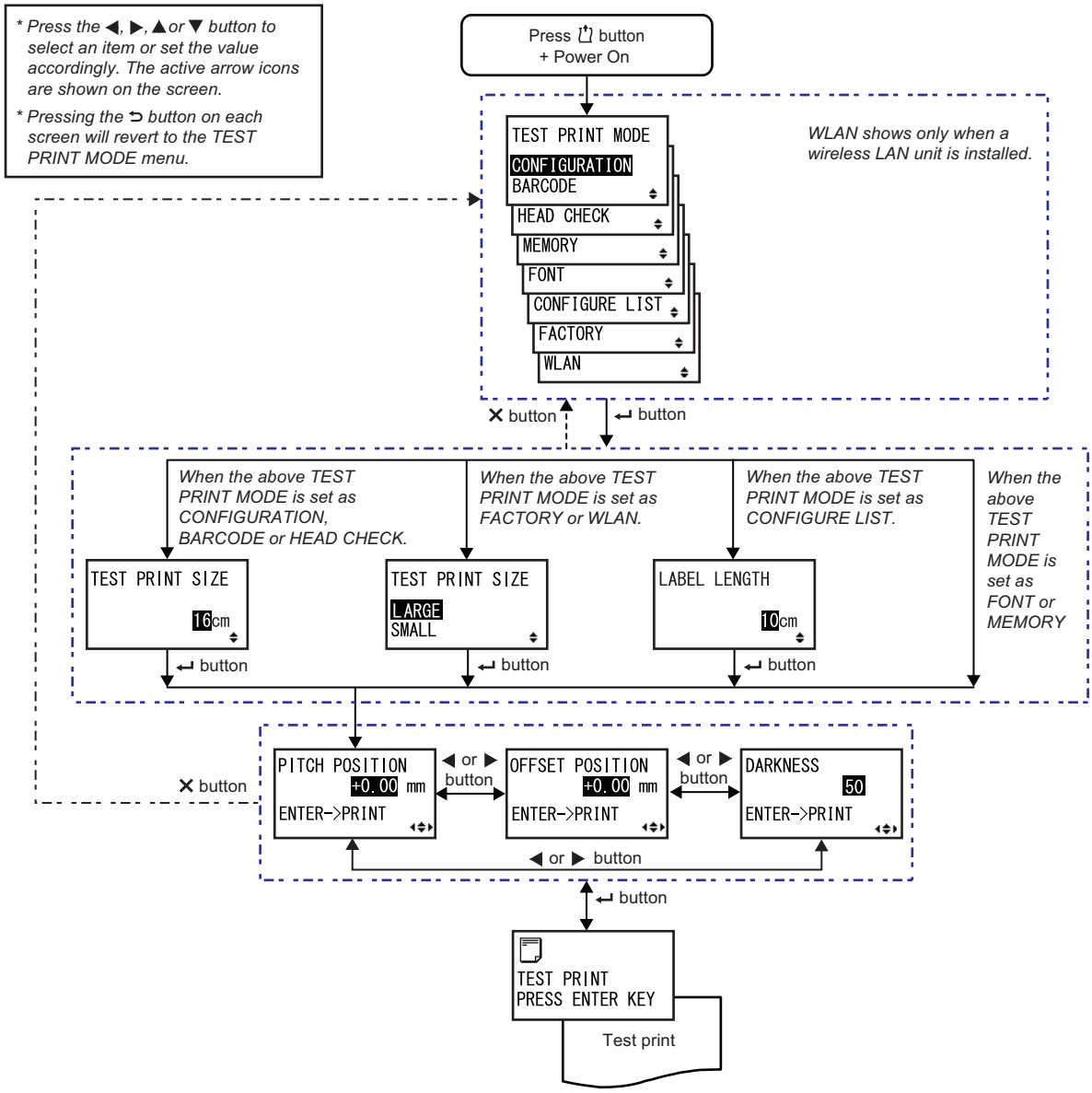
Note

- "-----" shows when the interface is not detected.
- DISABLE shows that the INTERFACE AUTO SELECT function is disabled (manual setting).
- IEEE1284, RS-232C, LAN, USB, WLAN or Bluetooth shows the detected interface.



4.2.17 Test Print Mode

The flowchart shows the sequence of the setting screens for the test print mode. The table describes each setting screen in detail.


* Press the ◀, ▶, ▲or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.
* Pressing the ⮌ button on each screen will revert to the TEST PRINT MODE menu.
Press button + Power On
TEST PRINT MODE
CONFIGURATION
BARCODE
HEAD CHECK
MEMORY
FONT
CONFIGURE LIST
FACTORY
WLAN
WLAN shows only when a wireless LAN unit is installed.
✕ button
↵ button
When the above TEST PRINT MODE is set as CONFIGURATION, BARCODE or HEAD CHECK.
When the above TEST PRINT MODE is set as FACTORY or WLAN.
When the above TEST PRINT MODE is set as CONFIGURE LIST.
When the above TEST PRINT MODE is set as FONT or MEMORY
TEST PRINT SIZE
16cm
TEST PRINT SIZE
LARGE
SMALL
LABEL LENGTH
10cm
↵ button
✕ button
PITCH POSITION
+0.00 mm
ENTER->PRINT
◀ or ▶ button
OFFSET POSITION
+0.00 mm
DARKNESS
50
◀ or ▶ button
TEST PRINT
PRESS ENTER KEY
Test print

Note

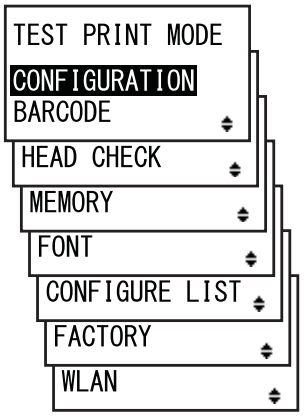
- When EXTERNAL SIGNAL in the ADVANCED MODE menu is set to ENABLE, the printer is unable to perform the test print correctly.
  Make sure that the EXTERNAL SIGNAL is set to DISABLE before perform test print.
- When RFID mode is enabled, RFID related information is printed on the second page of the CONFIGURATION test print.

TEST PRINT MODE

Select the test print contents.

- **CONFIGURATION**: Print the configuration settings of the printer.
- **BARCODE**: Print the barcodes installed in this printer.
- **HEAD CHECK**: Print the head check pattern of the selected media size area.
- **MEMORY**: Print the contents of the memory in this printer.
- **FONT**: Print the contents of the fonts installed in this printer.
- **CONFIGURE LIST**: Print the configure list of the printer.
- **FACTORY**: Perform the factory test print.
- **WLAN**: Print the wireless LAN settings of the printer.

Note
WLAN shows only if a wireless LAN unit is installed.

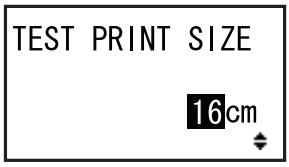


TEST PRINT SIZE

Set the width of the test print in 1 cm steps.
The setting range varies depending on the model as follows:

Model Name	Setting Range (cm)	Default Value (cm)
S84-ex	04-10	10
S86-ex	05-16	16

Note
Shows only if TEST PRINT MODE is set to CONFIGURATION, BARCODE or HEAD CHECK.

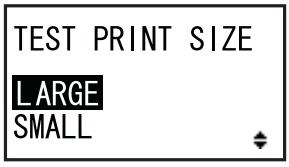


TEST PRINT SIZE

Select the width of the test print from LARGE or SMALL.
The available width varies depending on the model as follows:

Model Name	LARGE (cm)	SMALL (cm)
S84-ex	10	4
S86-ex	16	5

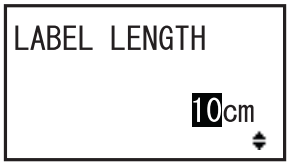
Note
Shows only if TEST PRINT MODE is set to FACTORY or WLAN.



LABEL LENGTH

Set the length of the test print.
The setting range is from 5 to 20 cm and is adjustable by 1 cm.

Note
Shows only if TEST PRINT MODE is set to CONFIGURE LIST.

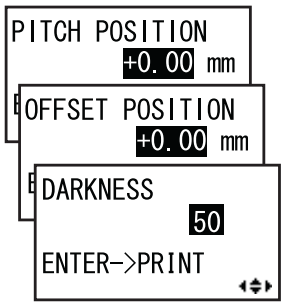


PITCH POSITION/OFFSET POSITION/DARKNESS

Adjust the print position, offset position and print darkness.
The setting range for both PITCH POSITION and OFFSET POSITION is ±3.75 mm (±0.15”) and is adjustable by 0.25 mm (0.01”).
The setting range for DARKNESS is from 00 to 99.

Note

Press the ↵ **ENTER** button to start the test print.



TEST PRINT PRESS ENTER KEY

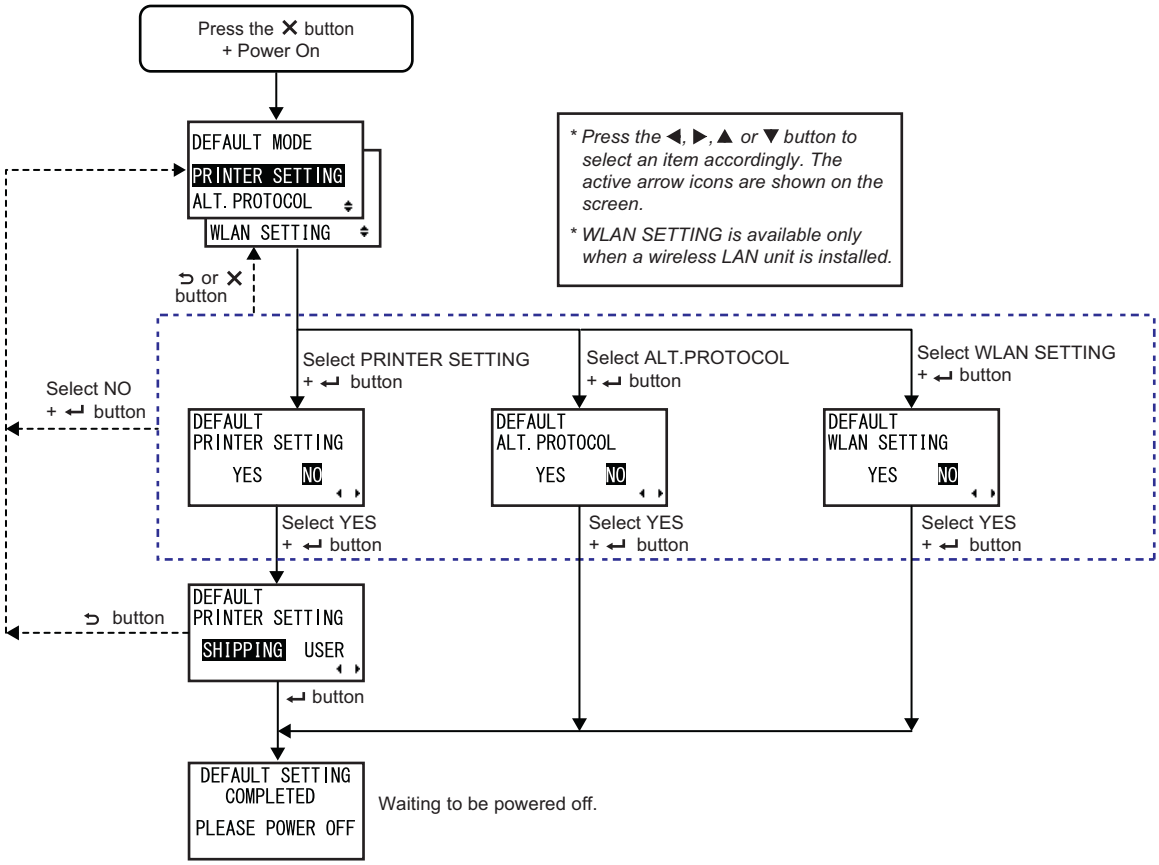
The test print is in progress.

Press the ↵ **ENTER** button while printing to pause the test print operation. Press the ↵ **ENTER** button again to continue.



4.2.18 Default Setting Mode

The printer can be reset to the default setting as in the factory preset.
The flowchart shows the sequence of the setting screens for the default setting mode. The table describes each setting screen in detail.

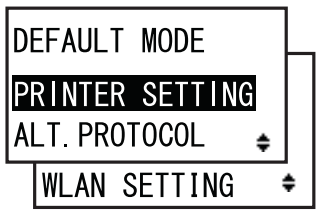

Press the ✕ button
+ Power On
DEFAULT MODE
PRINTER SETTING
ALT. PROTOCOL
WLAN SETTING
* Press the ◀, ▶, ▲ or ▼ button to select an item accordingly. The active arrow icons are shown on the screen.
* WLAN SETTING is available only when a wireless LAN unit is installed.
⮌ or ✕ button
Select PRINTER SETTING + ↵ button
Select ALT.PROTOCOL + ↵ button
Select WLAN SETTING + ↵ button
Select NO + ↵ button
DEFAULT PRINTER SETTING YES NO
DEFAULT ALT. PROTOCOL YES NO
DEFAULT WLAN SETTING YES NO
Select YES + ↵ button
Select YES + ↵ button
Select YES + ↵ button
⮌ button
DEFAULT PRINTER SETTING SHIPPING USER
↵ button
DEFAULT SETTING COMPLETED
PLEASE POWER OFF
Waiting to be powered off.

DEFAULT MODE

Select the item to be initialized.

- **PRINTER SETTING**: Initialize the printer setting.
- **ALT. PROTOCOL**: Initialize the protocol code.
- **WLAN SETTING**: Initialize the WLAN setting.

Note
WLAN SETTING shows only if a wireless LAN unit is installed.

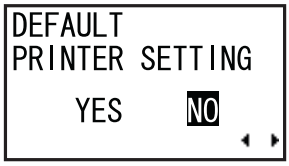


DEFAULT PRINTER SETTING

Select whether or not to initialize the printer setting.

- **YES**: Initialize the printer setting.
- **NO**: Cancel and return to the DEFAULT MODE screen.

Note
Shows only if DEFAULT MODE is set to PRINTER SETTING.

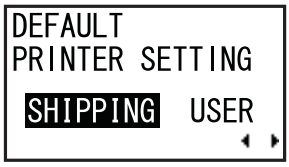


DEFAULT PRINTER SETTING SHIPPING USER

Select the initialization type.

- **SHIPPING**: Initialize the printer to the shipping state.
- **USER**: Initialize the printer to the state with the SAVE USER DEF setting.

Note
- Shows only if DEFAULT PRINTER SETTING is set to YES.
- If you have selected USER when the SAVE USER DEF is not registered, the printer will be initialized to the shipping state.

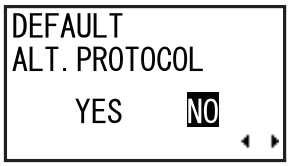


DEFAULT ALT. PROTOCOL

Select whether or not to initialize the protocol code.

- **YES**: Initialize the protocol code.
- **NO**: Cancel and return to the DEFAULT MODE screen.

Note
Shows only if DEFAULT MODE is set to ALT. PROTOCOL.

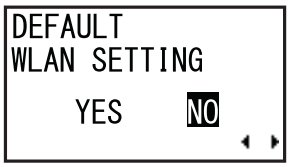


DEFAULT WLAN SETTING

Select whether or not to initialize the WLAN setting.

- **YES**: Initialize the WLAN setting.
- **NO**: Cancel and return to the DEFAULT MODE screen.

Note
Shows only if DEFAULT MODE is set to WLAN SETTING.



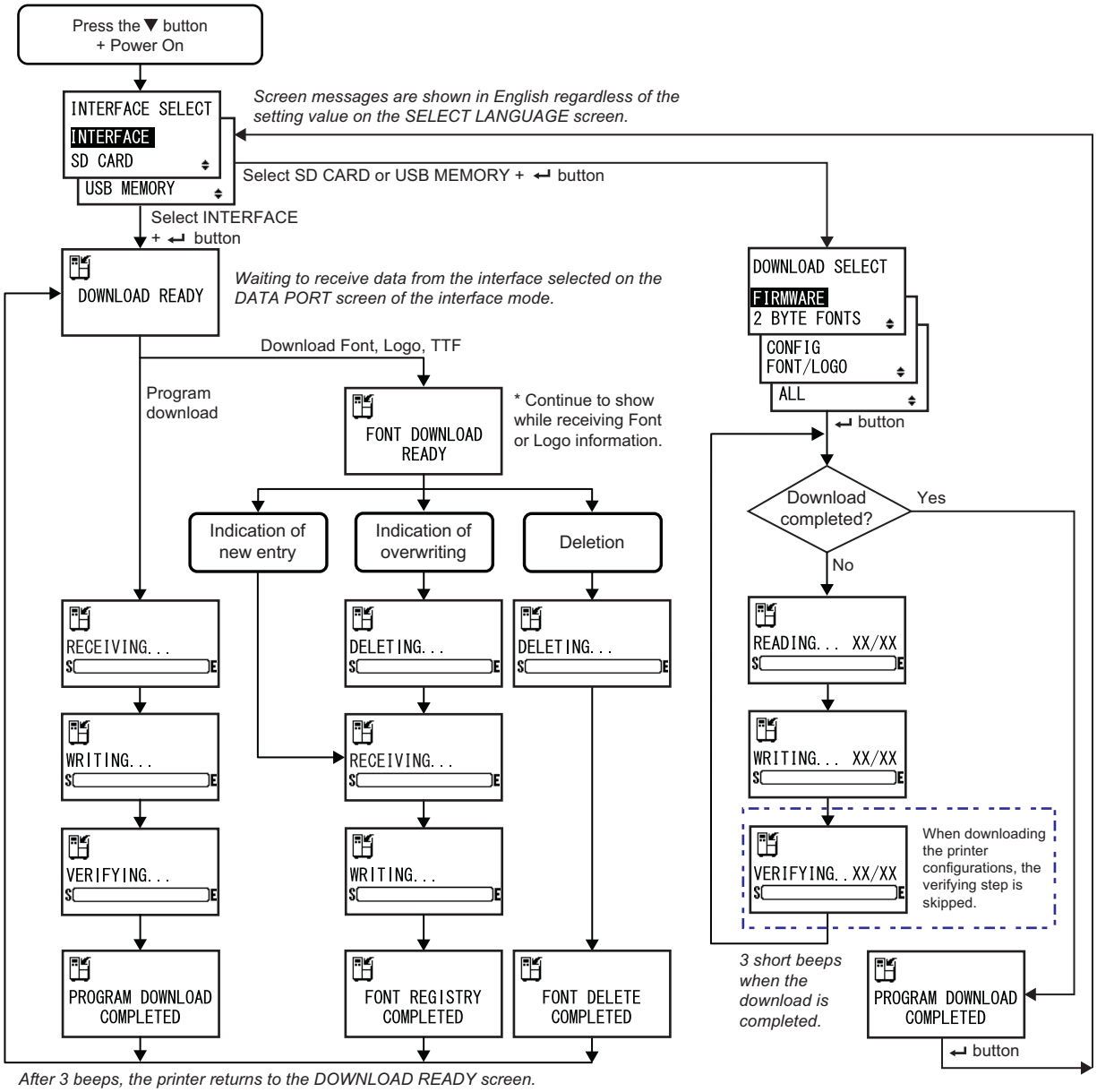
DEFAULT SETTING COMPLETED	
Shows when the initialization has been completed. **Note** The setting will be effective only if you power on the printer again.	DEFAULT SETTING COMPLETED PLEASE POWER OFF

4.2.19 Download Mode

This download feature allows the operator to download data (firmware, font/logo, TrueType font, configuration) from the host computer through the interface, SD card or USB memory and write in the Flash ROM memory. When downloading is complete, the LCD screen will return to the original screen after three seconds. If an error occurs, an error message will show and the reason will be identified. The flowchart shows the sequence of the setting screens for the download mode. The table describes each setting screen in detail.

⚠ CAUTION

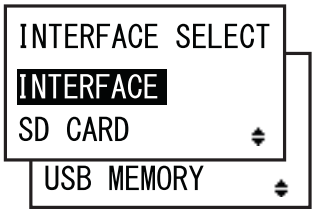
Be sure to perform a virus check for the USB memory or SD card before connecting it to the printer. SATO Corporation shall not be held responsible for a malfunction of the printer caused by a virus infection through the USB memory or SD card.



INTERFACE SELECT

Select the download method.

- **INTERFACE**: Download the program from the interface.
- **SD CARD**: Download the program from an SD card.
- **USB MEMORY**: Download the program from a USB memory.



DOWNLOAD READY

The printer is waiting to receive download data from the interface selected on the DATA PORT screen in the interface mode.
The following data will be received from the PC and written to the main ROM.
(1) Firmware data
(2) Font/logo data
(3) TrueType font
When firmware data is received, it goes to the RECEIVING… screen.
When font, logo and TrueType font are received, it goes to the FONT DOWNLOAD READY screen.

Note
Shows only if INTERFACE SELECT is set to INTERFACE.



FONT DOWNLOAD READY

The printer is waiting to receive font data.
When downloading the font for the first time, it goes to the RECEIVING… screen.
When overwriting or deleting existing font data, it goes to the DELETING… screen.

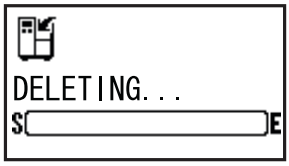
Note
Shows only if INTERFACE SELECT is set to INTERFACE.



DELETING. . .

The printer is deleting the existing font data.
The bar on the lower portion of the screen indicates the data deletion progress.
When overwriting font data after deleting, it goes to the RECEIVING… screen.
When just deleting font data, it goes to the FONT DELETE COMPLETED screen.

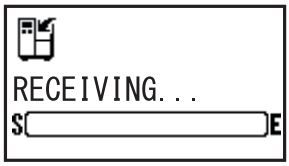
Note
Shows only if INTERFACE SELECT is set to INTERFACE.



RECEIVING. . .

The printer is receiving downloaded data.
The bar on the lower portion of the screen indicates the data reception progress.
After receiving downloaded data, it goes to the WRITING… screen.

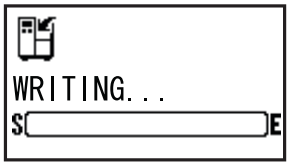
Note
Shows only if INTERFACE SELECT is set to INTERFACE.



WRITING. . .

The printer is writing downloaded data.
The bar on the lower portion of the screen indicates the data writing progress.
After writing downloaded data, it goes to the FONT REGISTRY COMPLETED screen.

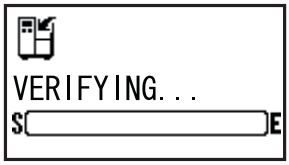
Note
Shows only if INTERFACE SELECT is set to INTERFACE.



VERIFYING. . .

The printer is verifying the firmware data.
The bar on the lower portion of the screen indicates the data verification progress.
After verifying the firmware data, it goes to the PROGRAM DOWNLOAD COMPLETED screen.

Note
Shows only if INTERFACE SELECT is set to INTERFACE.



PROGRAM DOWNLOAD COMPLETED

This screen shows the completion of the download.
Three beeps will sound when the program download is completed.
If downloading through INTERFACE, it will return to the DOWNLOAD READY screen.

If downloading through SD CARD or USB MEMORY, press the ↵ **ENTER** button to return to the INTERFACE SELECT screen.



FONT REGISTRY COMPLETED

This screen shows the completion of the font registry.
Three beeps will sound when the font registry is completed.
The printer returns to the DOWNLOAD READY screen.

Note
Shows only if INTERFACE SELECT is set to INTERFACE.



FONT DELETE COMPLETED

This screen shows the completion of the font deletion.
Three beeps will sound when the font deletion is completed.
The printer returns to the DOWNLOAD READY screen.

Note
Shows only if INTERFACE SELECT is set to INTERFACE.

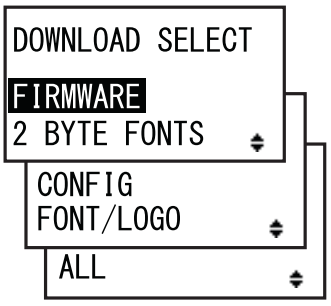


DOWNLOAD SELECT

Select the item to be downloaded.

- **FIRMWARE**: Download “Firmware”, “2 byte fonts” and “Outline font”.
- **2 BYTE FONTS**: Download “2 byte fonts” and “Outline font”.
- **CONFIG**: Download printer configurations.
- **FONT/LOGO**: Download font/logo data.
- **ALL**: Download all data.

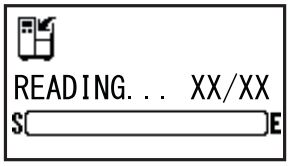
Note
Shows only if INTERFACE SELECT is set to SD CARD or USB MEMORY.



READING. . . XX/XX (DOWNLOAD)

The printer is reading the downloaded data.
The bar on the lower portion of the screen indicates the data reading progress.
XX/XX shows the file number being read and total number of files.
After reading the data, it goes to the WRITING… screen.

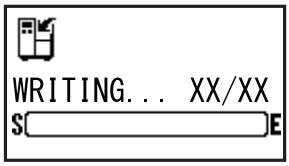
Note
Shows only if INTERFACE SELECT is set to SD CARD or USB MEMORY.



WRITING. . . XX/XX (DOWNLOAD)

The printer is writing the downloaded data.
The bar on the lower portion of the screen indicates the data writing progress.
XX/XX shows the file number being written and total number of files.
After writing the data, it goes to the VERIFYING... screen.

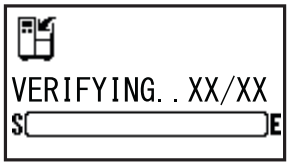
Note
Shows only if INTERFACE SELECT is set to SD CARD or USB MEMORY.



VERIFYING. . . XX/XX (DOWNLOAD)

The printer is verifying the downloaded data.
The bar on the lower portion of the screen indicates the data verification progress.
XX/XX shows the file number being verified and total number of files.
After verifying the data, it goes to the PROGRAM DOWNLOAD COMPLETED screen.

Note
Shows only if INTERFACE SELECT is set to SD CARD or USB MEMORY.

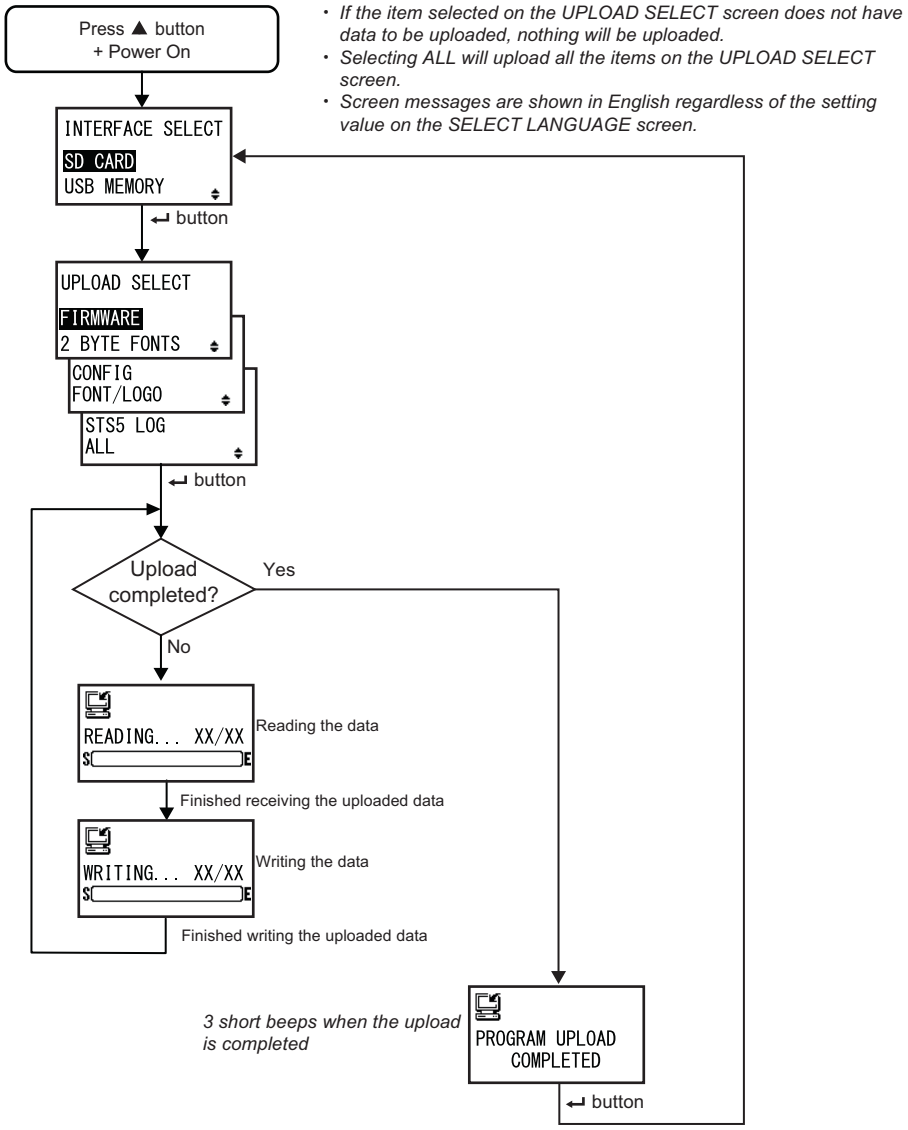


4.2.20 Upload Mode

The upload feature allows the operator to upload data (firmware, font/logo, TrueType font, configuration, status5 log) from the printer and write it to an SD card or USB memory. When uploading is complete, the LCD screen will return to the original screen after three seconds. If an error occurs, an error message will show and the reason will be identified.

⚠ CAUTION

Be sure to perform a virus check for the USB memory or SD card before connecting it to the printer. SATO Corporation shall not be held responsible for a malfunction of the printer caused by a virus infection through the USB memory or SD card.



INTERFACE SELECT

Select the upload method.

- **SD CARD**: Upload data to an SD card.
- **USB MEMORY**: Upload data to a USB memory.

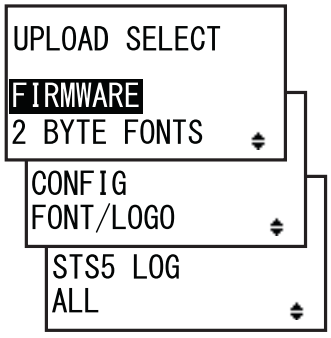
Note
The setting information of the wireless LAN is saved only if the wireless LAN is connected.



UPLOAD SELECT

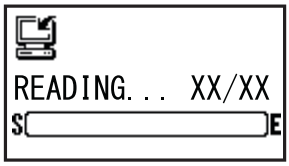
Select the item to be uploaded.

- **FIRMWARE**: Upload “Firmware”.
- **2 BYTE FONTS**: Upload “2 byte fonts” and “Outline font”.
- **CONFIG**: Upload printer configurations.
- **FONT/LOGO**: Upload font/logo data.
- **STS5 LOG**: Upload Status5 log.
- **ALL**: Upload all data.



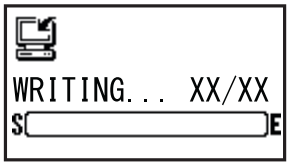
READING. . . XX/XX (UPLOAD)

The printer is reading the uploaded data.
The bar on the lower portion of the screen indicates the data reading progress.
XX/XX shows the file number being read and total number of files.
After reading the data, it goes to the WRITING… screen.



WRITING. . . XX/XX (UPLOAD)

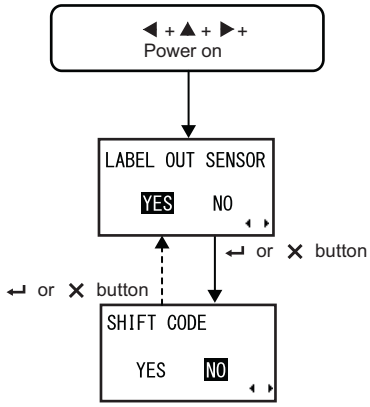
The printer is writing the uploaded data.
The bar on the lower portion of the screen indicates the data writing progress.
XX/XX shows the file number being written and total number of files.

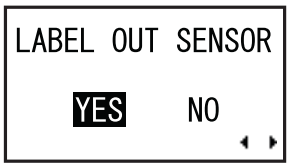


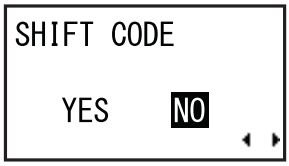
PROGRAM UPLOAD COMPLETED	
This screen shows the completion of the upload. Three beeps will sound when the program upload is completed. Press the ↵ **ENTER** button to return to the INTERFACE SELECT screen.	

4.2.21 Hidden Setting Mode

This mode allows the operator access to set the label out sensor status and work shift mode status. The flowchart shows the sequence of the setting screens for the hidden setting mode. The table describes each setting screen in detail.



LABEL OUT SENSOR	
Enable or disable the paper end detection. • **YES**: Enable the paper end detection. • **NO**: Disable the paper end detection.	

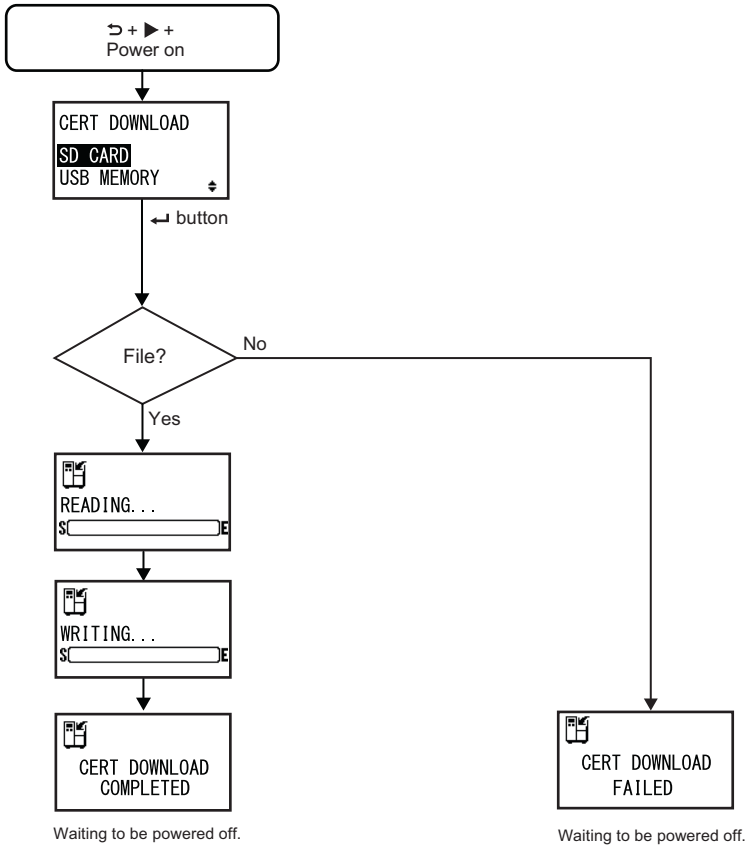
SHIFT CODE	
Enable or disable the work shift setting mode. • **YES**: Enable the work shift setting mode. • **NO**: Disable the work shift setting mode. **Note** For details on the work shift setting mode, refer to **Section 4.2.6 Work Shift Setting Mode**.	

4.2.22 Wireless LAN Certificate Download Mode

This mode allows the user to download the wireless LAN certification data.
The flowchart shows the sequence of the setting screens for the wireless LAN certificate download mode. The table describes each setting screen in detail.

⚠ CAUTION

Be sure to perform a virus check for the USB memory or SD card before connecting it to the printer. SATO Corporation shall not be held responsible for a malfunction of the printer caused by a virus infection through the USB memory or SD card.



CERT DOWNLOAD

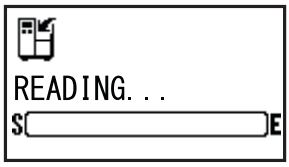
Select the download method of the certification data.

- **SD CARD**: Download data from an SD card.
- **USB MEMORY**: Download data from a USB memory.



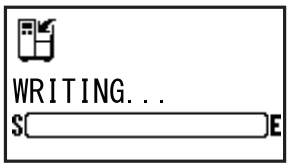
READING. . . (CERT DOWNLOAD)

The printer is reading the certification data.
The bar on the lower portion of the screen indicates the certification data reading progress.



WRITING. . . (CERT DOWNLOAD)

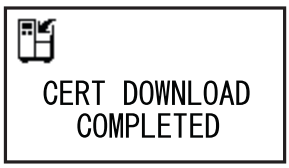
The printer is writing the certification data.
The bar on the lower portion of the screen indicates the certification data writing progress.



CERT DOWNLOAD COMPLETED

This screen shows when the certification data download is completed.

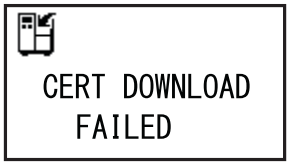
Note
The setting will be effective only if you power on the printer again.



CERT DOWNLOAD FAILED

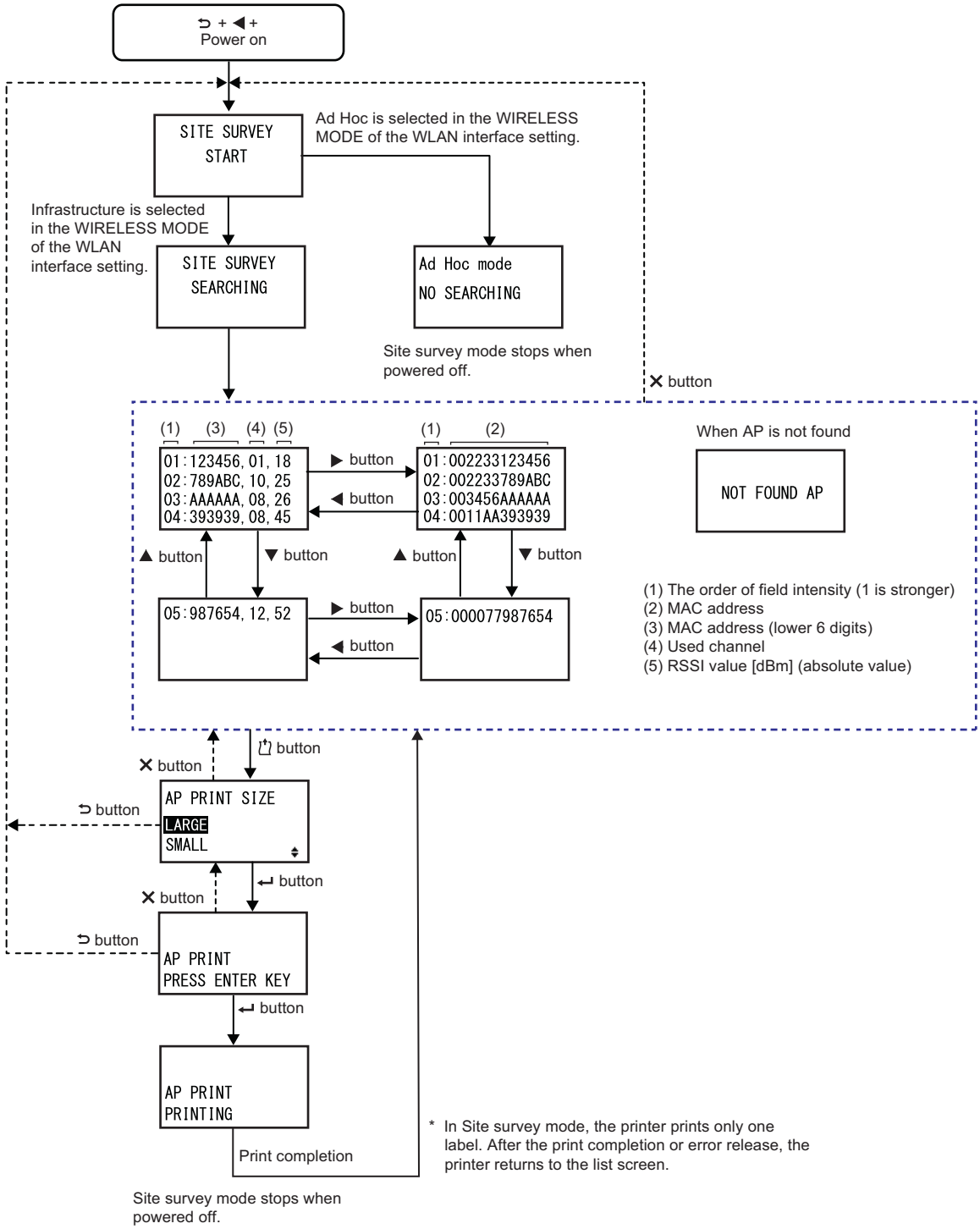
This screen shows when the certification data download has failed.
Power on the printer and try again.

Note
Make sure that there are certification files in the SD card or USB memory.



4.2.23 Site Survey Mode

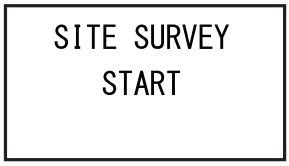
This mode allows you to acquire the information of access points.
The flowchart shows the sequence of the setting screens for the site survey mode. The table describes each setting screen in detail.



SITE SURVEY START

This is the initial screen of the site survey mode.

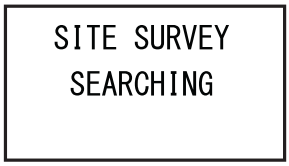
Press the ↵ **ENTER** button to start the site survey.
If Infrastructure is selected in the WIRELESS MODE of the WLAN interface setting, the printer goes to the SITE SURVEY SEARCHING screen.
If Ad Hoc is selected in the WIRELESS MODE of the WLAN interface setting, the printer goes to the Ad Hoc mode screen.



SITE SURVEY SEARCHING

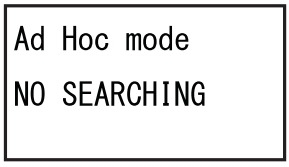
The printer is acquiring information necessary for the site survey.
The field intensity, channel and MAC address for a maximum of sixty-four access points will be searched.
After acquiring the information, the printer automatically goes to the next screen.

Note
Shows only if the WIRELESS MODE of the WLAN interface setting is set to Infrastructure.



Ad Hoc mode NO SEARCHING

This is a warning screen when the site survey mode is started if the WIRELESS MODE of the WLAN interface setting is set to Ad Hoc.
Power on the printer again.

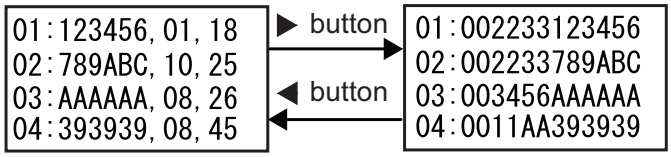


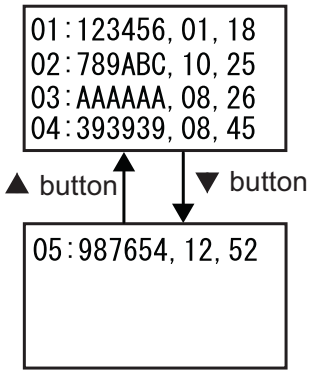
SITE SURVEY INFORMATION

These screens show the information of the site survey.
In the first line on the upper screen to the right, 01 indicates the strongest field density, 123456 indicates the last six digits of the MAC address, 01 indicates the channel in use and 18 indicates the absolute RSSI value in dBm.

Each screen shows four access points. You can use the ▲/▼ buttons to toggle between screens.
A maximum of sixty-four access points can be shown.

You can show the full MAC address (twelve digits) by pressing the ◀/▶ buttons as shown below.



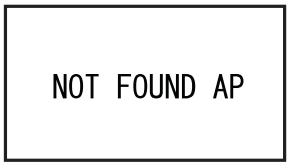


NOT FOUND AP

This screen shows when the printer cannot find an access point.

Note

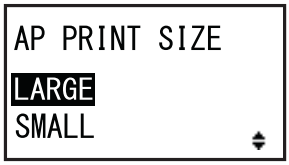
Press the ✕ **CANCEL** button to return to the SITE SURVEY START screen and try again.



AP PRINT SIZE

Select the print size for the site survey information.

- **LARGE**: Print the information with a width of 10 cm.
- **SMALL**: Print the information with a width of 4 cm.



AP PRINT PRESS ENTER KEY

The printer is ready to perform printing.

Press the ↵ **ENTER** button to start the test print of the site survey.



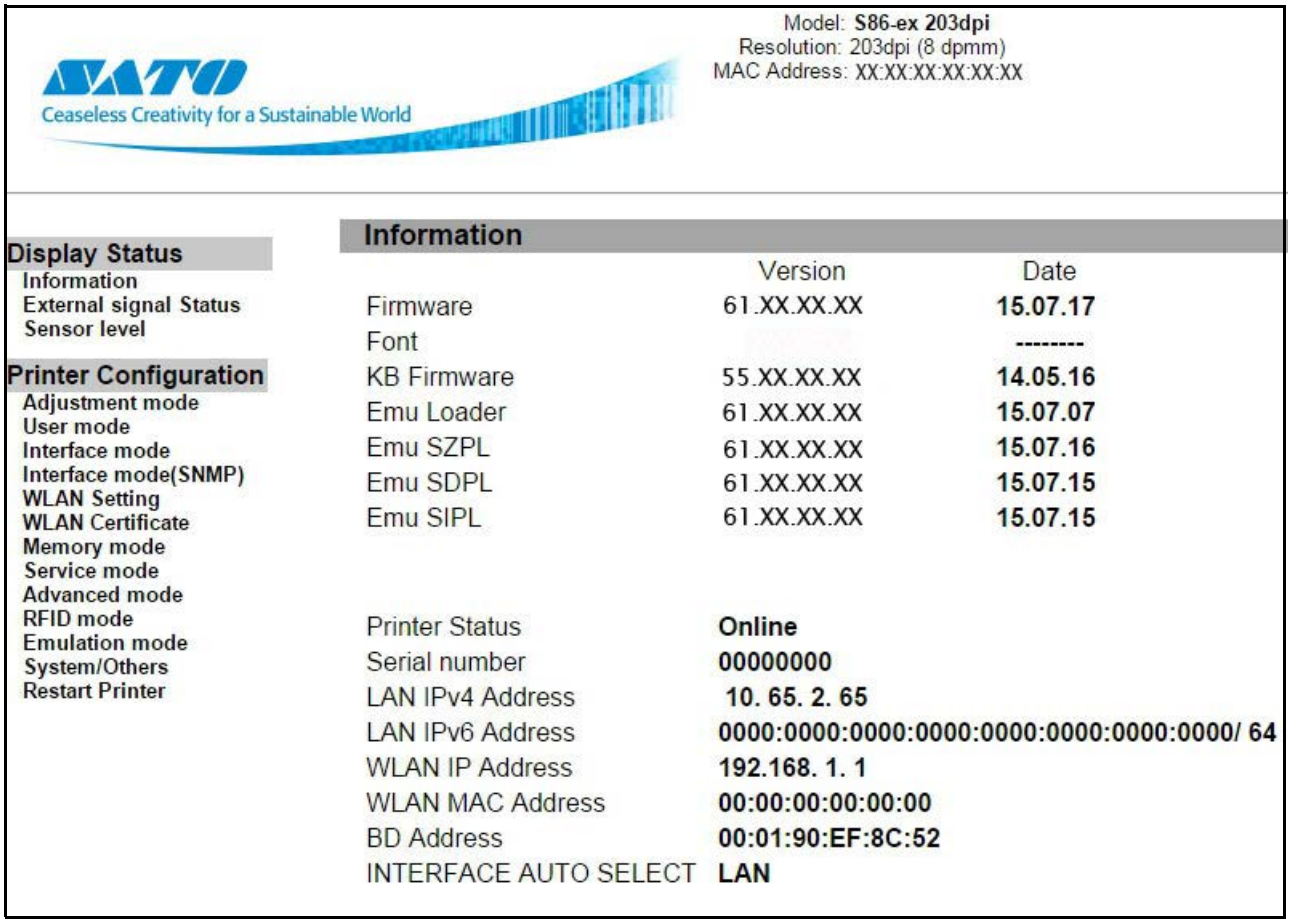
AP PRINT PRINTING	
The test print of the site survey is in progress. **Note** In site survey mode, the printer prints only one label. After the print completion or error release, the printer returns to the list screen.	

4.3 Web Configuration

The printer can be operated through a web configuration page using any browser.
With an Ethernet LAN or WLAN connection, users can remotely get information from the printer or perform the printer configuration.
You need the printer IP address to access the web configuration page. Refer to **Section 4.2.16 Information Mode** for the printer IP address.
If the printer IP address is 192.168.143.123, open up browser and enter the following URL:
192.168.143.123
When a security certificate is prompted, you must acknowledge and click Continue**.**
The web configuration page will be shown as follows.
On the upper right of each page, the model name, current resolution and MAC address are shown.
Display Status section shows specific information or status of the printer while Printer Configuration section allows users to perform adjustments and other printer operations.
You can view Information, External signal Status and Sensor level pages without logging in.
However, login is required to view Printer Configuration pages such as Adjustment mode and etc.

4.3.1 Information

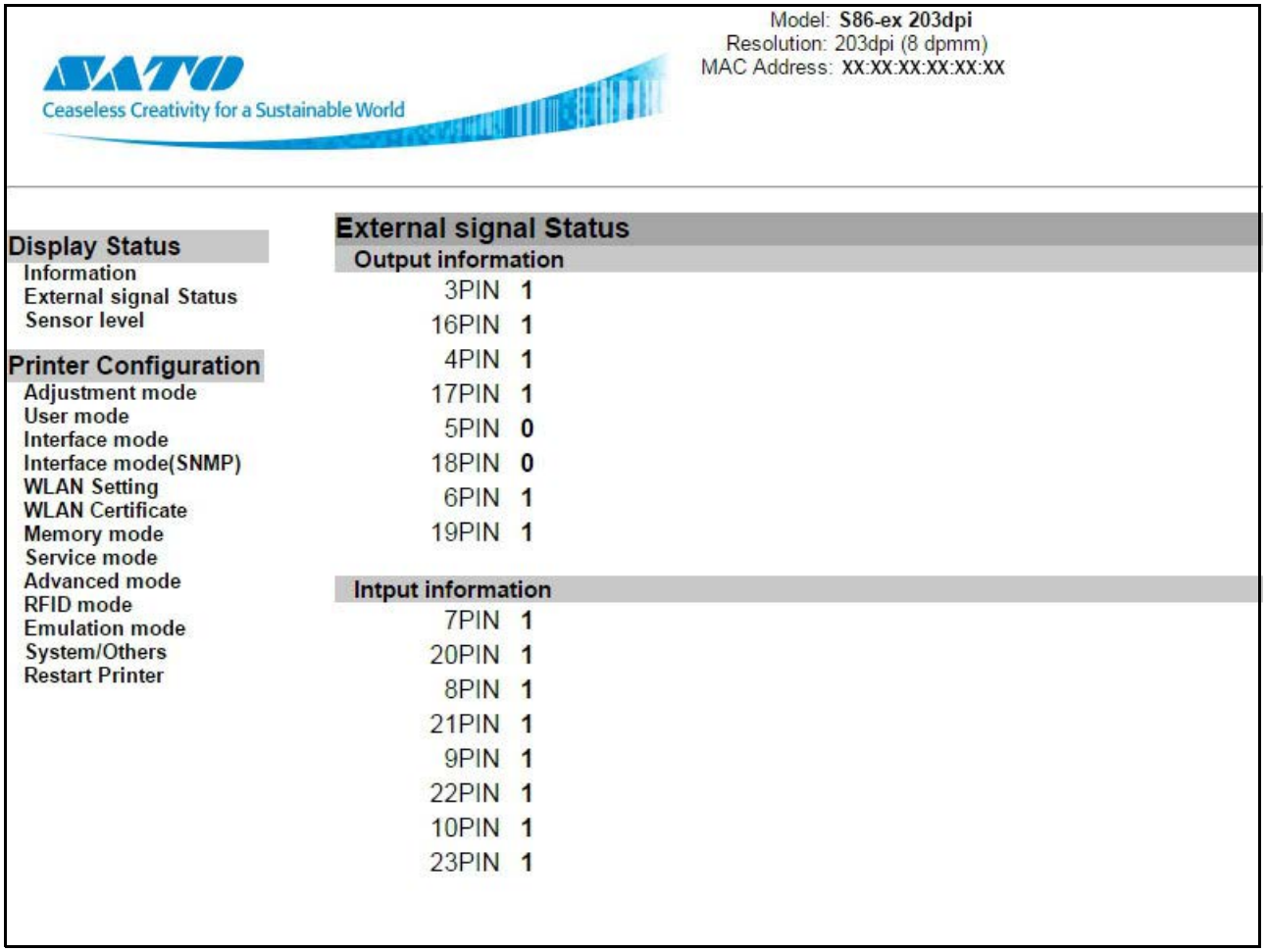
Information is the default page of web configuration.
The Information page is shown as follows.
Refer to **Section 4.2.16 Information Mode**.



Life counter	**265.2 M**
Head1 counter	**18.6 M**
Head2 counter	**0.0 M**
Head3 counter	**0.0 M**

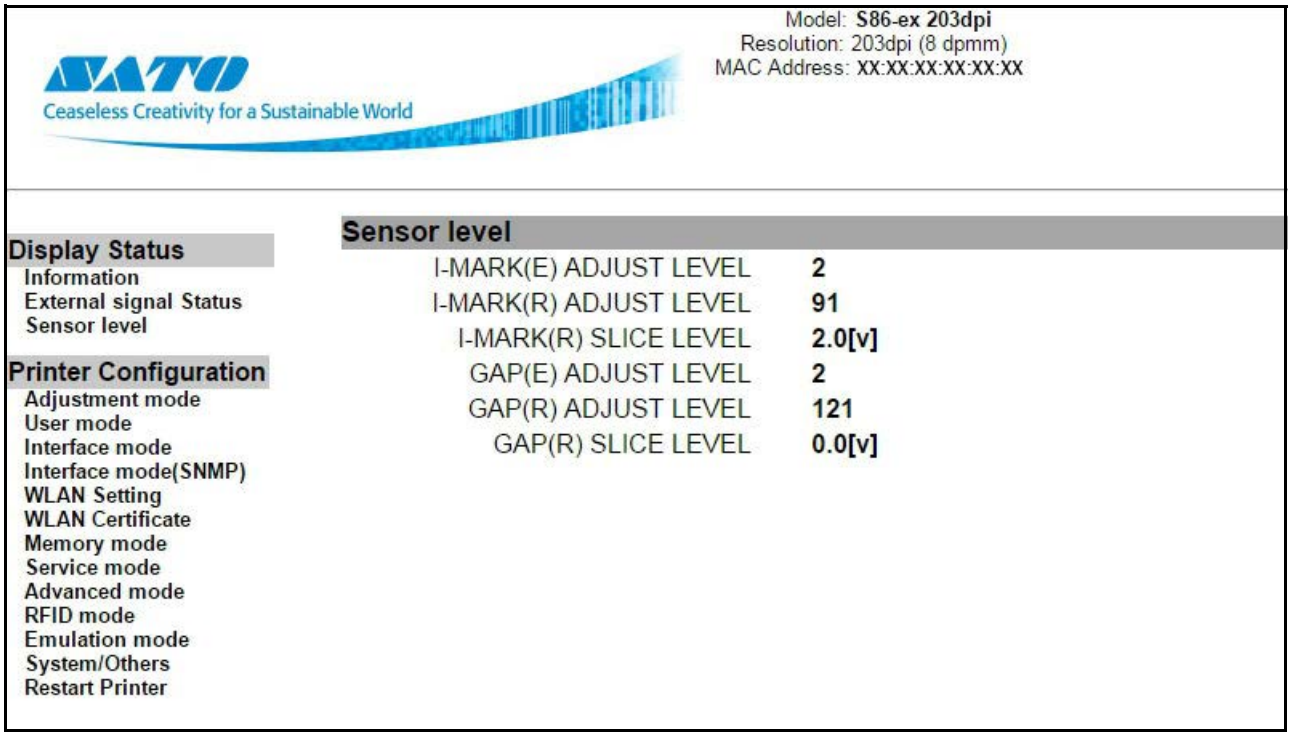
4.3.2 External Signal Status

The External signal Status page is shown as follows.
Refer to **Section 8.5 Input/Output Signal of the External Signal**.



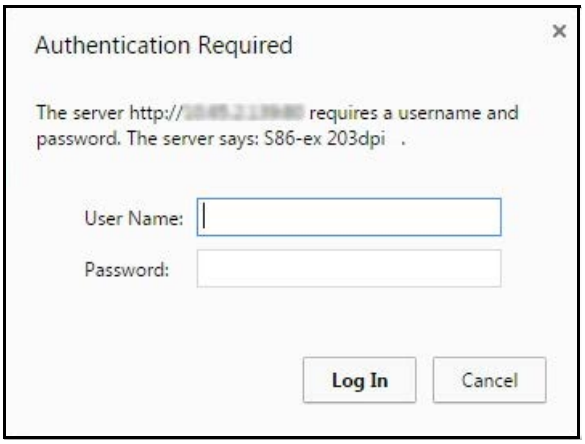
4.3.3 Sensor Level

The Sensor level page is shown as follows.
Refer to **Sensor Level Adjustments on page 120**.

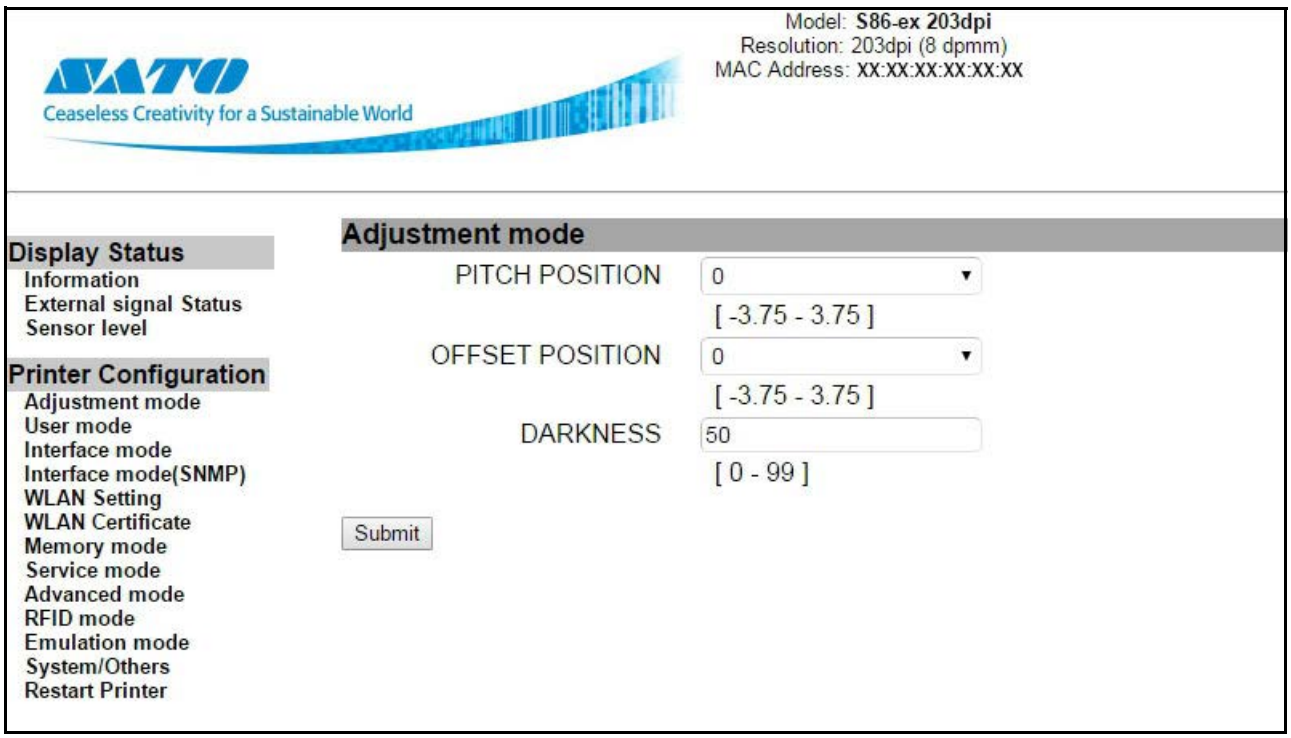


4.3.4 Adjustment Mode

Login is required to view this page. Enter the correct user name and password to log in.
The default user name and password are as follows:
User Name:admin
Password:admin

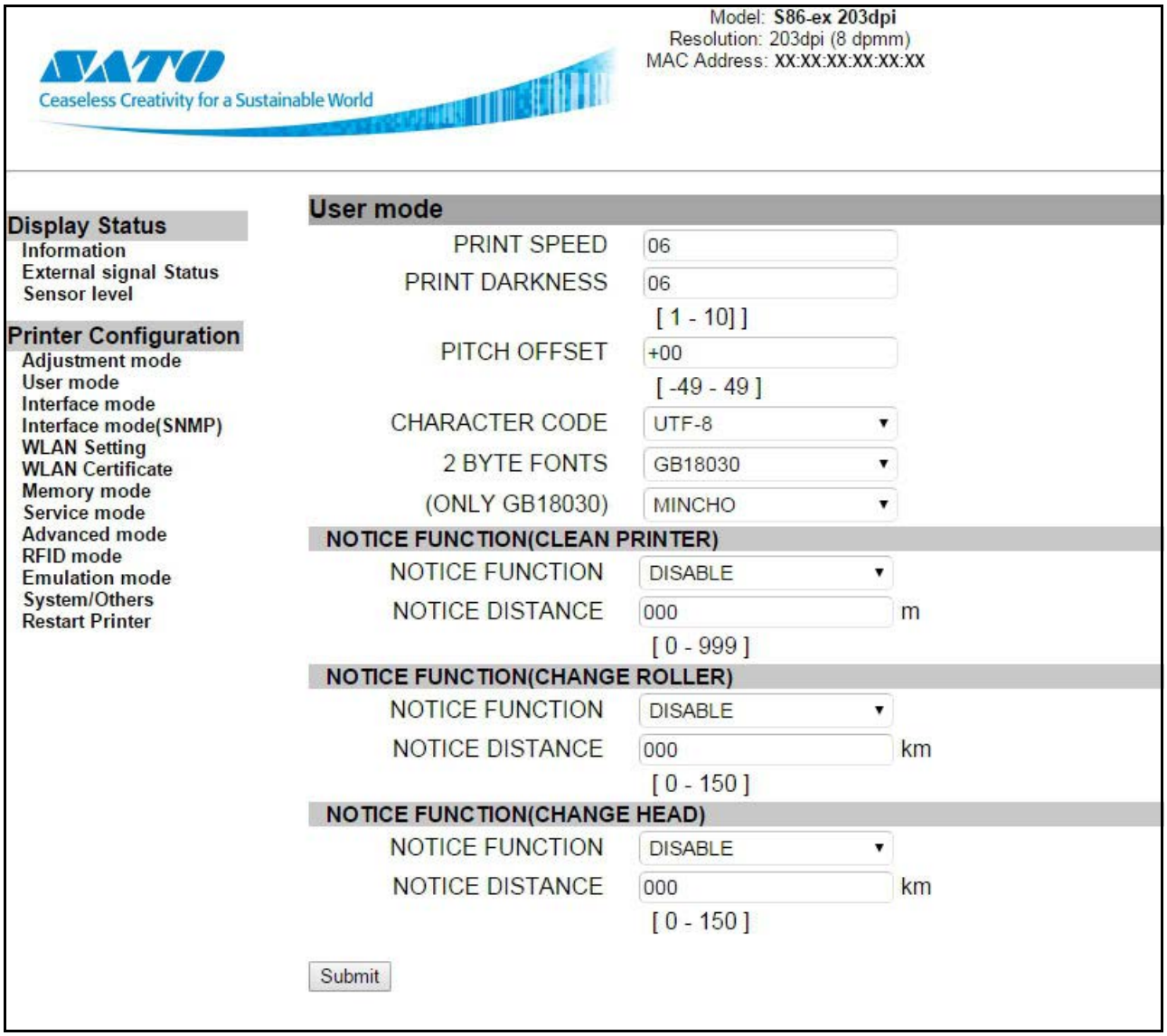


After logging in, the Adjustment mode page is shown as follows.
Refer to **Section 4.2.5 Adjustment Mode**.



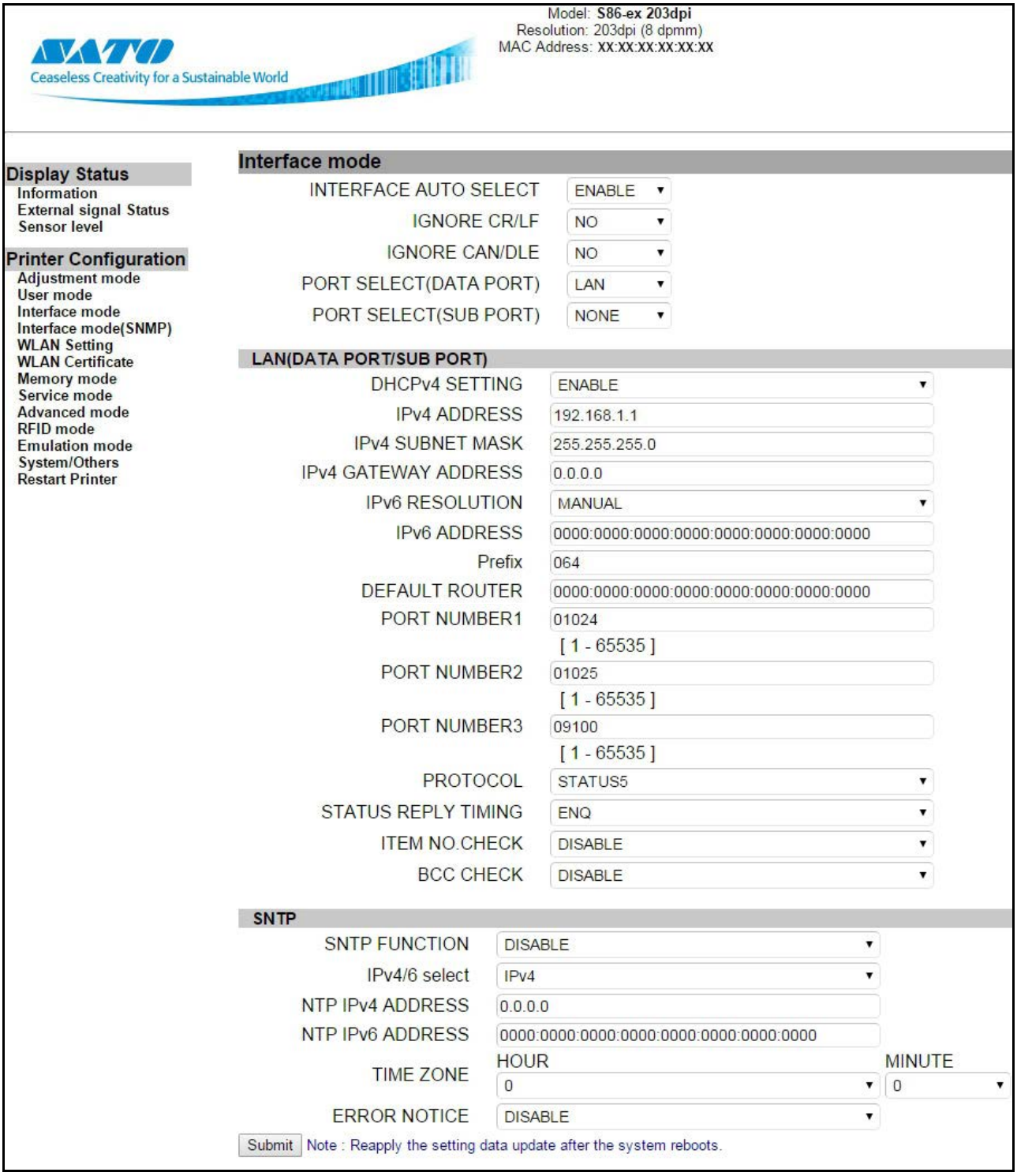
4.3.5 User Mode

Login is required to view this page. Enter the correct user name and password to log in as shown in **Section 4.3.4 Adjustment Mode**.
After logging in, the User mode page is shown as follows.
Refer to **Section 4.2.9 User Mode**.



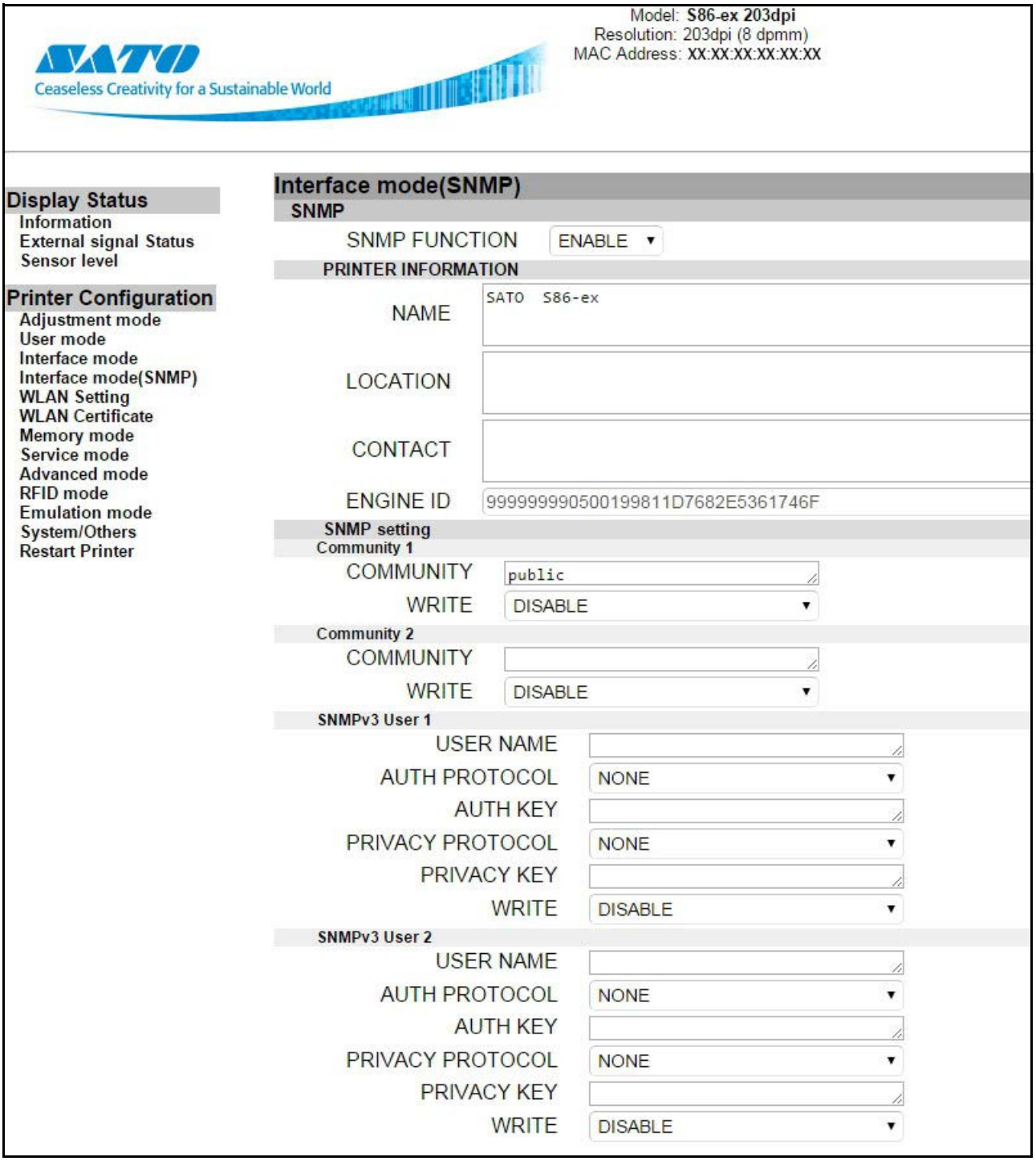
4.3.6 Interface Mode

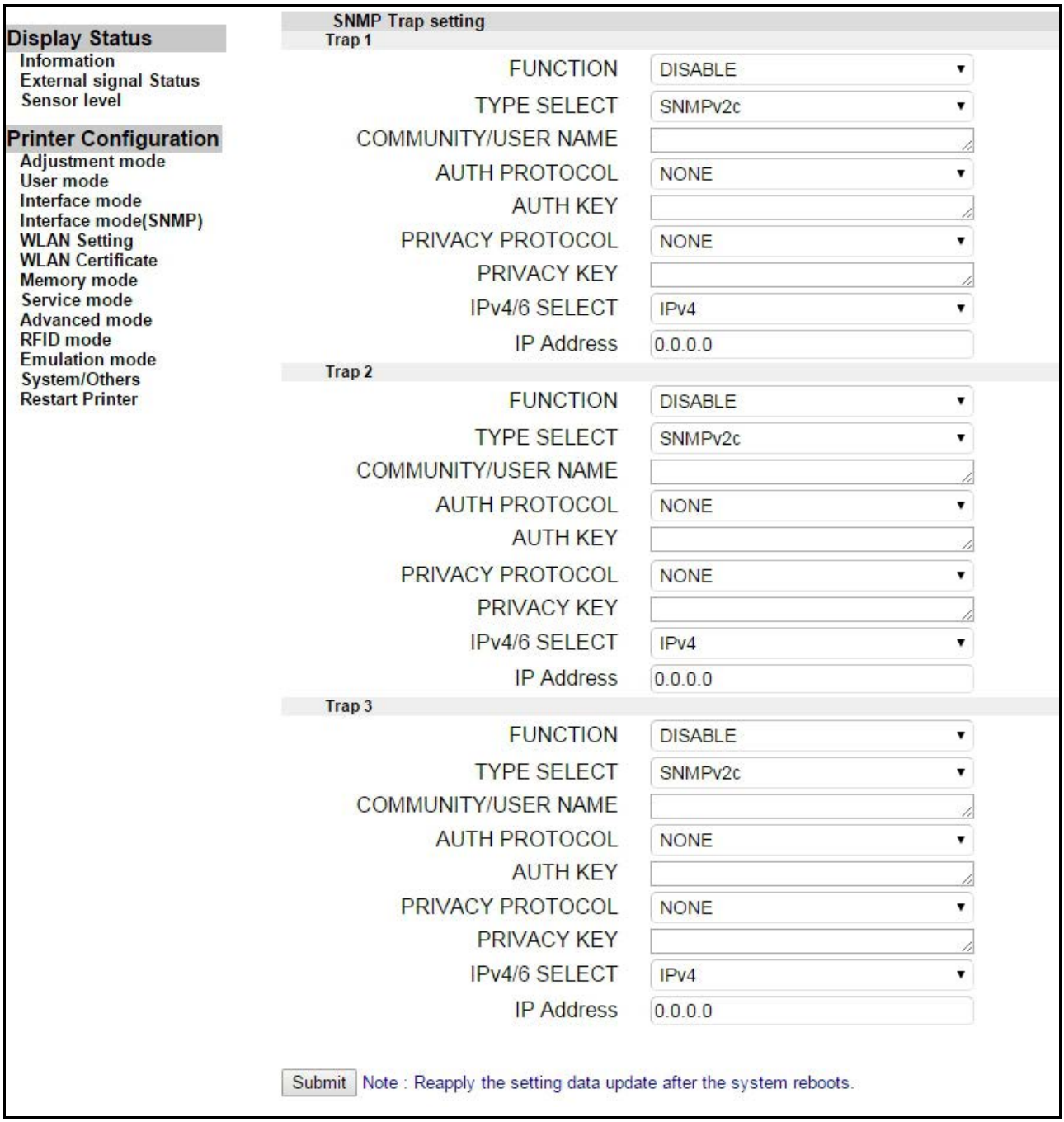
Login is required to view this page. Enter the correct user name and password to log in as shown in **Section 4.3.4 Adjustment Mode**.
After logging in, the Interface mode page is shown as follows (continued to the next page).
Refer to **Section 4.2.10 Interface Mode**.



4.3.7 Interface Mode (SNMP)

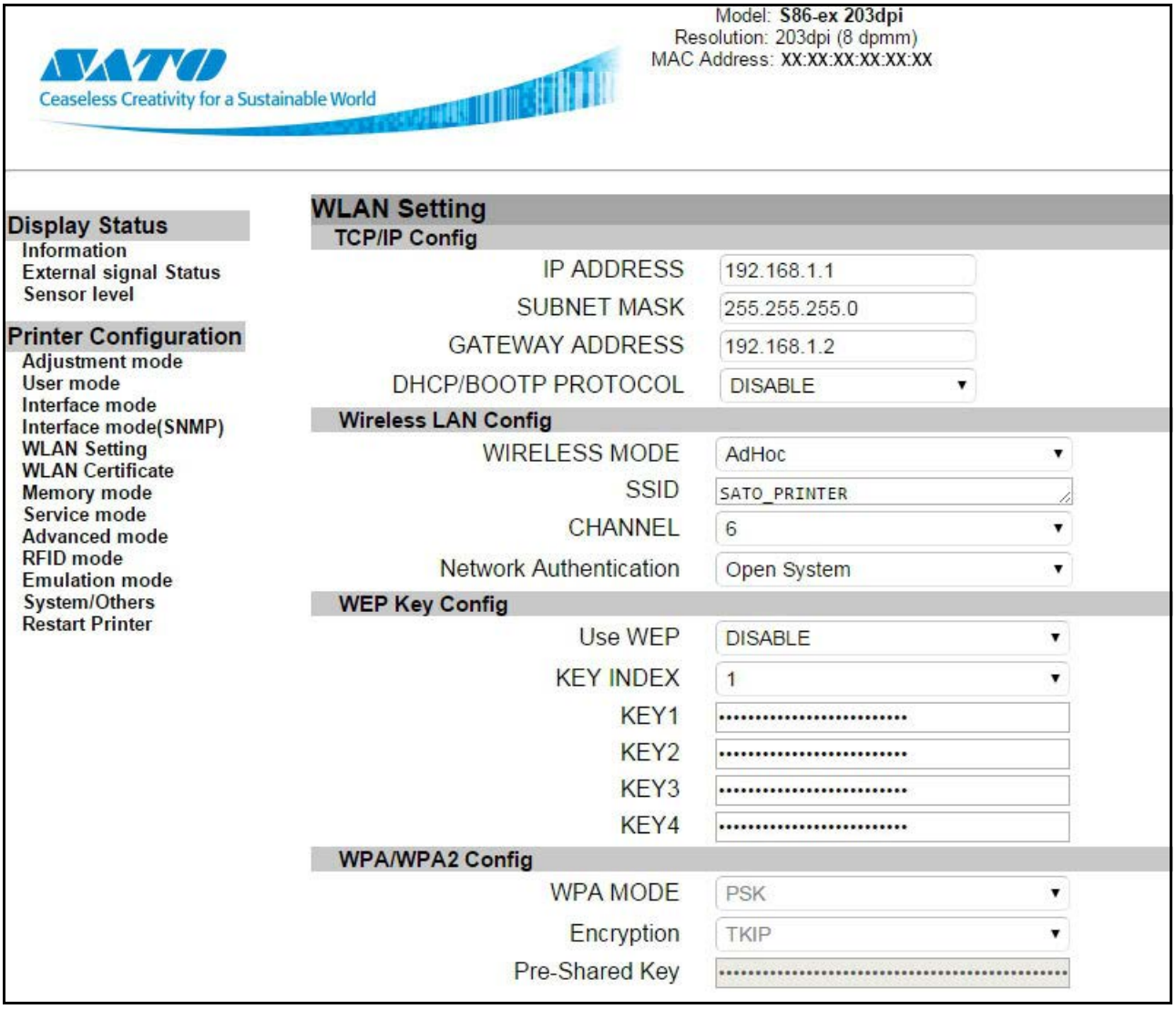
Login is required to view this page. Enter the correct user name and password to log in as shown in **Section 4.3.4 Adjustment Mode**.
After logging in, the Interface mode (SNMP) page is shown as follows (continued to the next page).
Refer to **SNMP FUNCTION on page 84**.

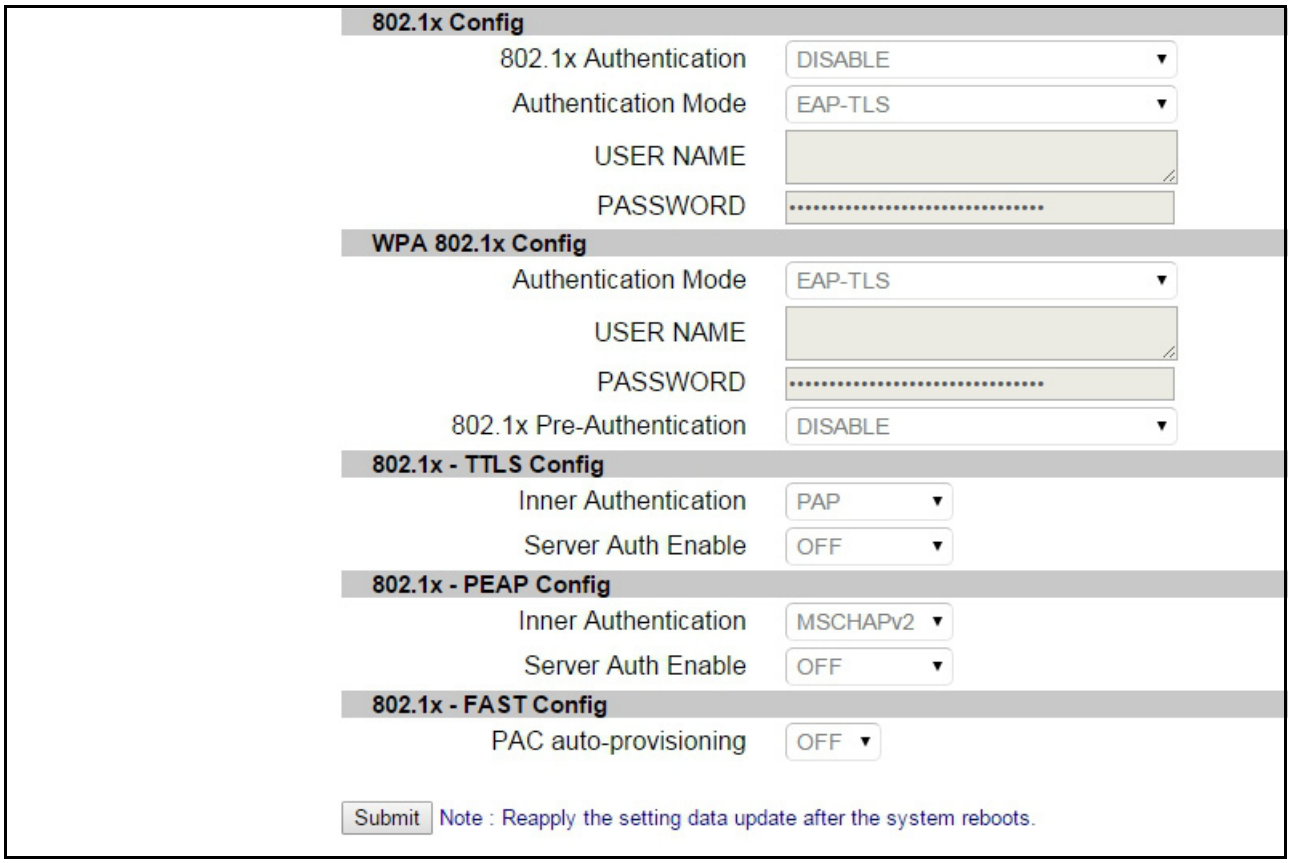



Display Status
Information
External signal Status
Sensor level
Printer Configuration
Adjustment mode
User mode
Interface mode
Interface mode(SNMP)
WLAN Setting
WLAN Certificate
Memory mode
Service mode
Advanced mode
RFID mode
Emulation mode
System/Others
Restart Printer
SNMP Trap setting
Trap 1
FUNCTION DISABLE
TYPE SELECT SNMPv2c
COMMUNITY/USER NAME
AUTH PROTOCOL NONE
AUTH KEY
PRIVACY PROTOCOL NONE
PRIVACY KEY
IPv4/6 SELECT IPv4
IP Address 0.0.0.0
Trap 2
FUNCTION DISABLE
TYPE SELECT SNMPv2c
COMMUNITY/USER NAME
AUTH PROTOCOL NONE
AUTH KEY
PRIVACY PROTOCOL NONE
PRIVACY KEY
IPv4/6 SELECT IPv4
IP Address 0.0.0.0
Trap 3
FUNCTION DISABLE
TYPE SELECT SNMPv2c
COMMUNITY/USER NAME
AUTH PROTOCOL NONE
AUTH KEY
PRIVACY PROTOCOL NONE
PRIVACY KEY
IPv4/6 SELECT IPv4
IP Address 0.0.0.0
Submit
Note : Reapply the setting data update after the system reboots.

4.3.8 WLAN Setting

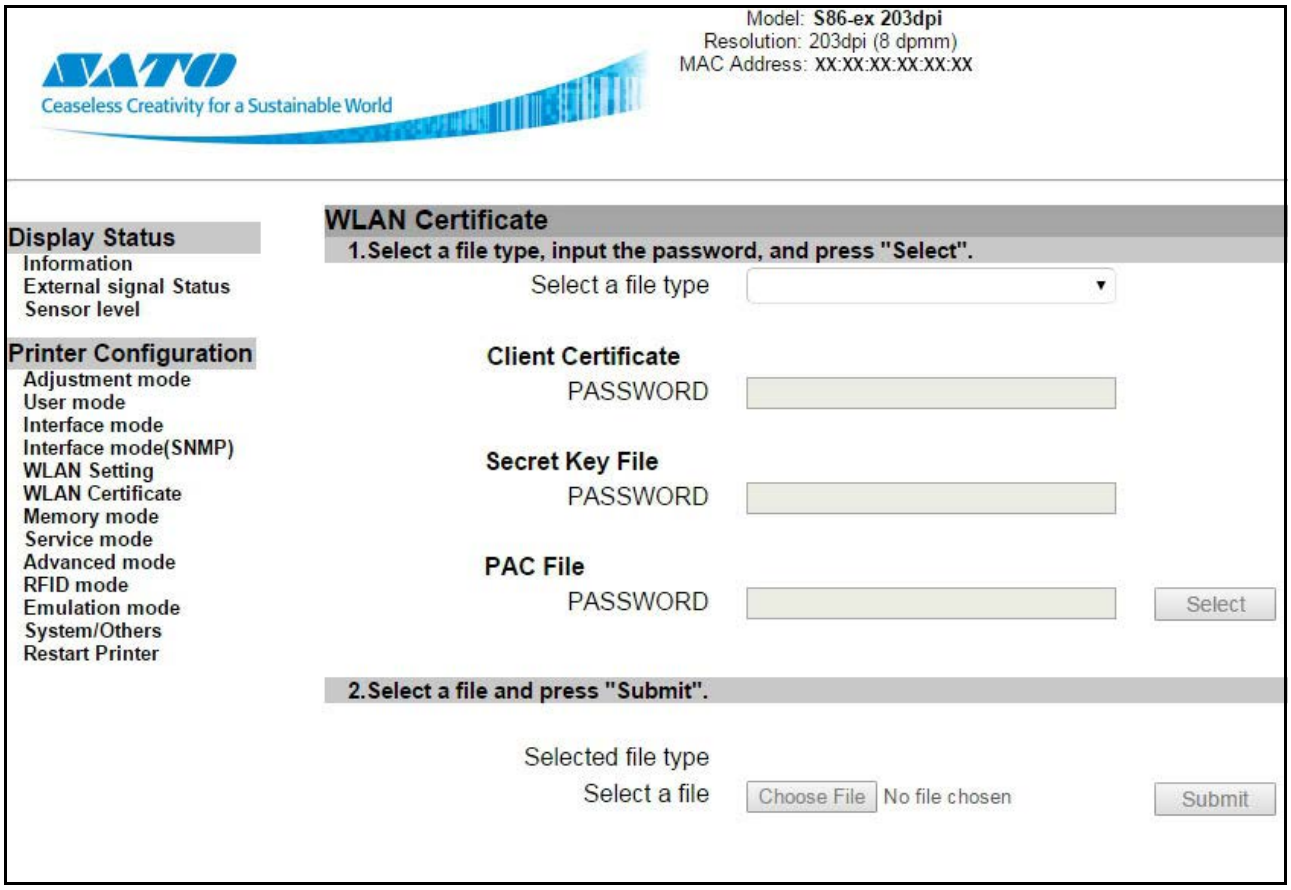
Login is required to view this page. Enter the correct user name and password to log in as shown in **Section 4.3.4 Adjustment Mode**.
After logging in, the WLAN Setting page is shown as follows (continued to the next page).
Refer to **Section 8.1.14 Wireless LAN Setting**.




802.1x Config
802.1x Authentication
DISABLE
Authentication Mode
EAP-TLS
USER NAME
PASSWORD
WPA 802.1x Config
Authentication Mode
EAP-TLS
USER NAME
PASSWORD
802.1x Pre-Authentication
DISABLE
802.1x - TTLS Config
Inner Authentication
PAP
Server Auth Enable
OFF
802.1x - PEAP Config
Inner Authentication
MSCHAPv2
Server Auth Enable
OFF
802.1x - FAST Config
PAC auto-provisioning
OFF
Submit
Note : Reapply the setting data update after the system reboots.

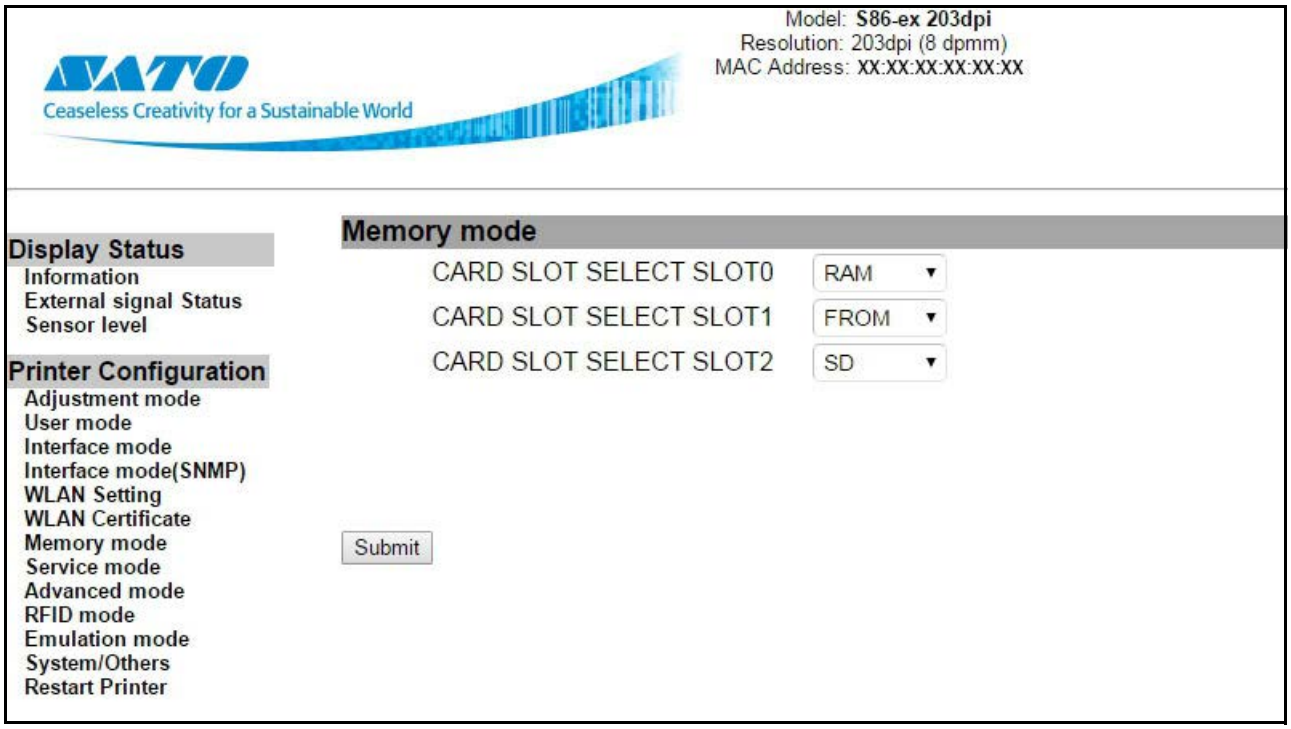
4.3.9 WLAN Certificate

Login is required to view this page. Enter the correct user name and password to log in as shown in **Section 4.3.4 Adjustment Mode**.
After logging in, the WLAN Certificate page is shown as follows.
Refer to **Section 4.2.22 Wireless LAN Certificate Download Mode**.



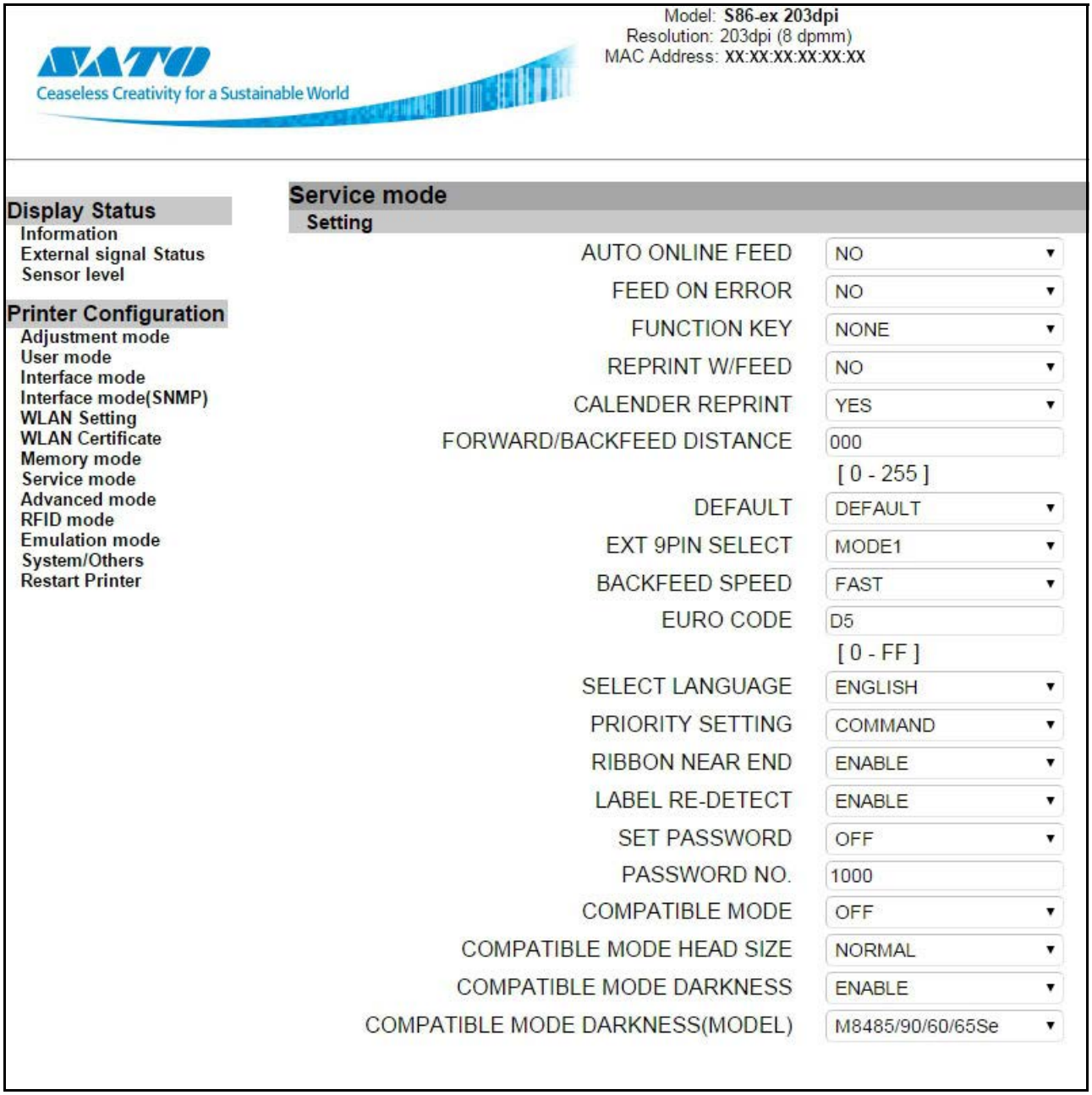
4.3.10 Memory Mode

Login is required to view this page. Enter the correct user name and password to log in as shown in **Section 4.3.4 Adjustment Mode**.
After logging in, the Memory mode page is shown as follows.
Refer to **Section 4.2.11 Memory Mode**.



4.3.11 Service Mode

Login is required to view this page. Enter the correct user name and password to log in as shown in **Section 4.3.4 Adjustment Mode**.
After logging in, the Service mode page is shown as follows (continued to the next page).
Refer to **Section 4.2.12 Service Mode**.



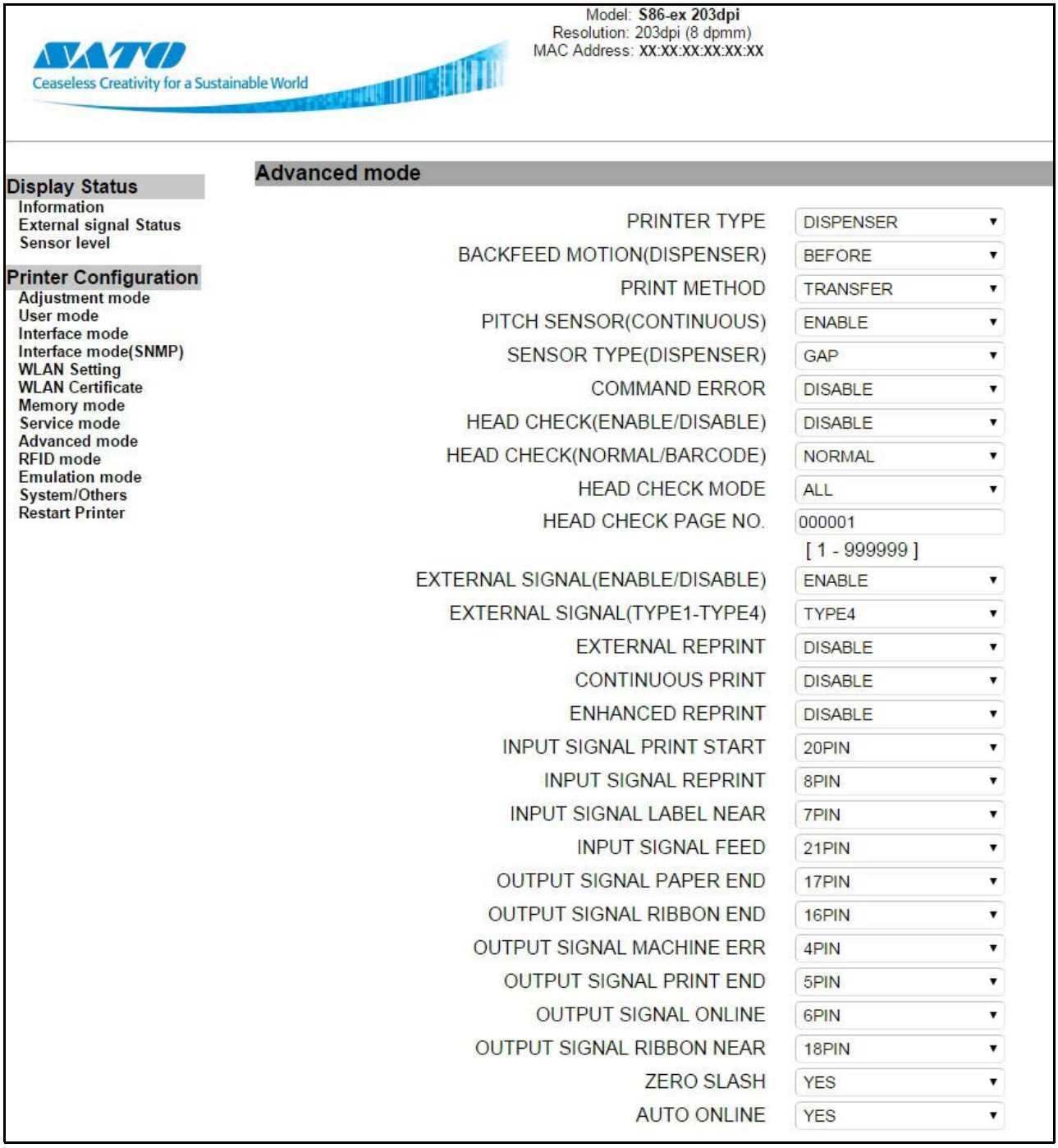
MEDIA LENGTH	0178
TRACE MODE	DISABLE
SAVE PRINT LOG	DISABLE
MEMORY SELECT	SD
OUTPUT PRINT LOG FROM SUBPORT	DISABLE
RIBBON TENSION ADJUSTMENT	12 [0 - 15]
THROUGHPUT	NORMAL
FEED OFFSET	000 [0 - 250]
BACKFEED OFFSET	000 [0 - 250]
TOTAL QTY DISPLAY	NO
PLUG & PLAY	ENABLE
REGION CODE	US
REPLY PERIOD	NORMAL
ENQ REPLY DELAY TIME	0000 [0 - 9999]
FONT SELECT GB18030	YES
FONT SELECT BIG5	YES
FONT SELECT KSX1001	YES
HEAD SELECT(S86-ex)	KPJ-168-8SAO8-

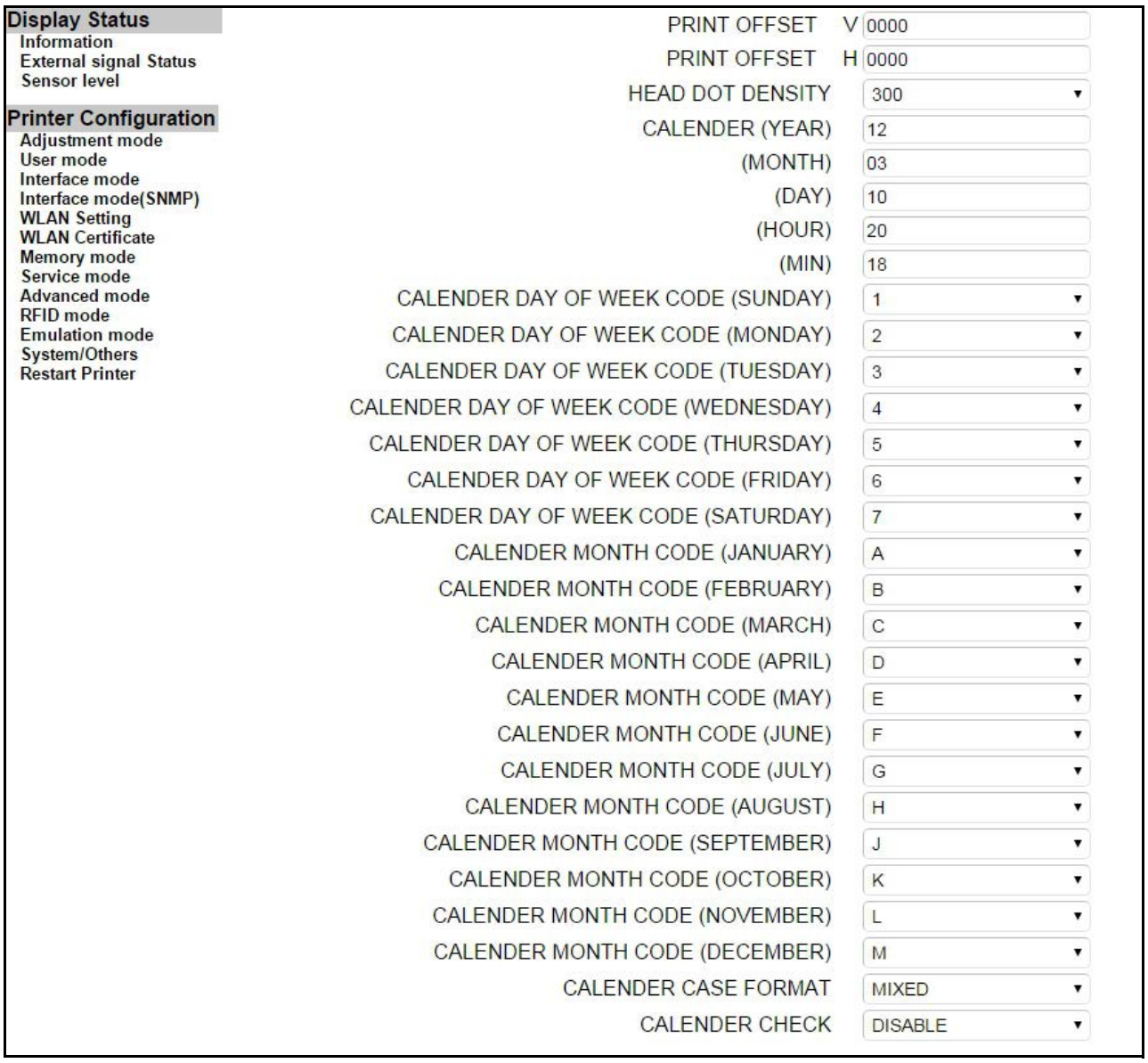
Please verify via label on print head, prior to making any changes to this setting.

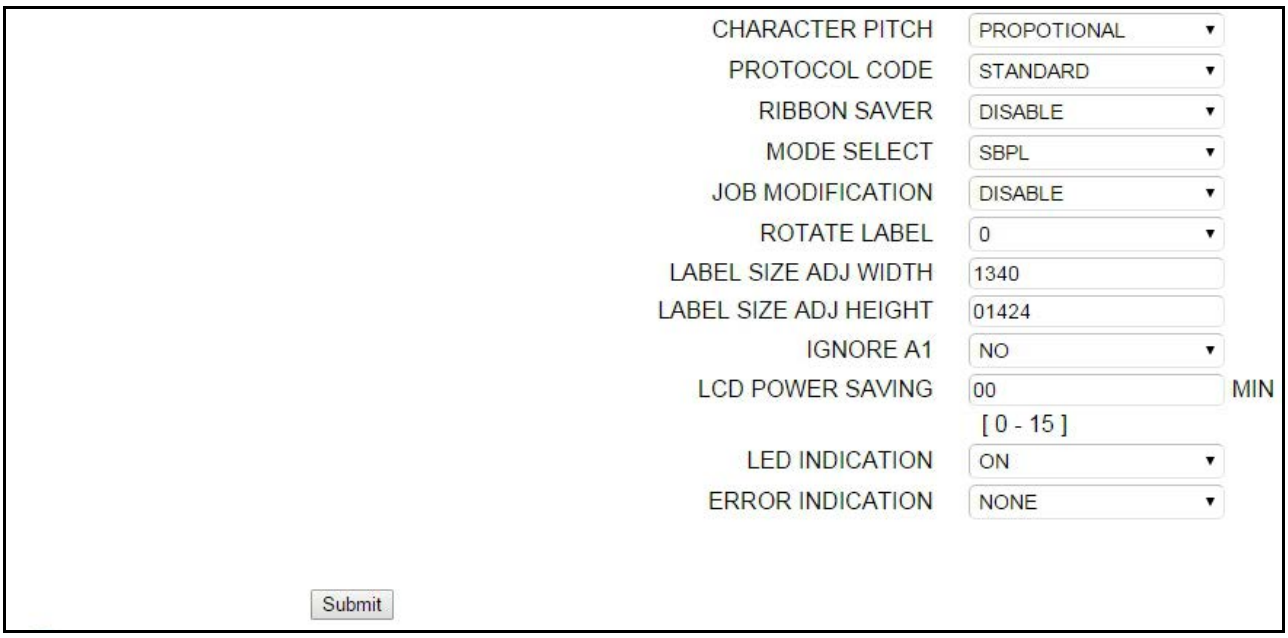
Submit Note : Reapply the setting data update after the system reboots.

4.3.12 Advanced Mode

Login is required to view this page. Enter the correct user name and password to log in as shown in **Section 4.3.4 Adjustment Mode**.
After logging in, the Advanced mode page is shown as follows (continued to the next two pages).
Refer to **Section 4.2.13 Advanced Mode**.

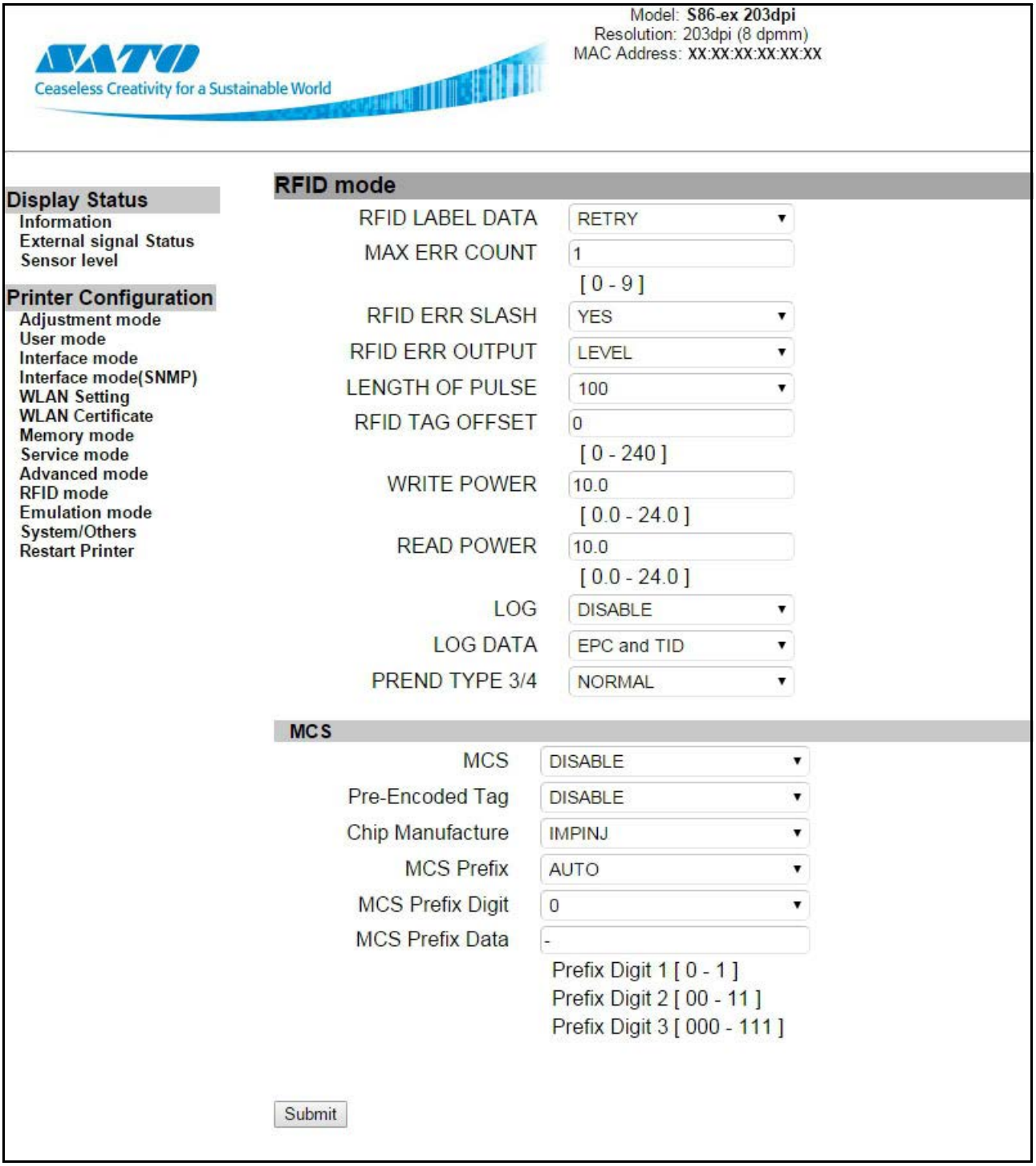



Display Status
Information
External signal Status
Sensor level
Printer Configuration
Adjustment mode
User mode
Interface mode
Interface mode(SNMP)
WLAN Setting
WLAN Certificate
Memory mode
Service mode
Advanced mode
RFID mode
Emulation mode
System/Others
Restart Printer
PRINT OFFSET V 0000
PRINT OFFSET H 0000
HEAD DOT DENSITY 300
CALENDER (YEAR) 12
(MONTH) 03
(DAY) 10
(HOUR) 20
(MIN) 18
CALENDER DAY OF WEEK CODE (SUNDAY) 1
CALENDER DAY OF WEEK CODE (MONDAY) 2
CALENDER DAY OF WEEK CODE (TUESDAY) 3
CALENDER DAY OF WEEK CODE (WEDNESDAY) 4
CALENDER DAY OF WEEK CODE (THURSDAY) 5
CALENDER DAY OF WEEK CODE (FRIDAY) 6
CALENDER DAY OF WEEK CODE (SATURDAY) 7
CALENDER MONTH CODE (JANUARY) A
CALENDER MONTH CODE (FEBRUARY) B
CALENDER MONTH CODE (MARCH) C
CALENDER MONTH CODE (APRIL) D
CALENDER MONTH CODE (MAY) E
CALENDER MONTH CODE (JUNE) F
CALENDER MONTH CODE (JULY) G
CALENDER MONTH CODE (AUGUST) H
CALENDER MONTH CODE (SEPTEMBER) J
CALENDER MONTH CODE (OCTOBER) K
CALENDER MONTH CODE (NOVEMBER) L
CALENDER MONTH CODE (DECEMBER) M
CALENDER CASE FORMAT MIXED
CALENDER CHECK DISABLE


CHARACTER PITCH
PROPOTIONAL
PROTOCOL CODE
STANDARD
RIBBON SAVER
DISABLE
MODE SELECT
SBPL
JOB MODIFICATION
DISABLE
ROTATE LABEL
0
LABEL SIZE ADJ WIDTH
1340
LABEL SIZE ADJ HEIGHT
01424
IGNORE A1
NO
LCD POWER SAVING
00
MIN
[0 - 15]
LED INDICATION
ON
ERROR INDICATION
NONE
Submit

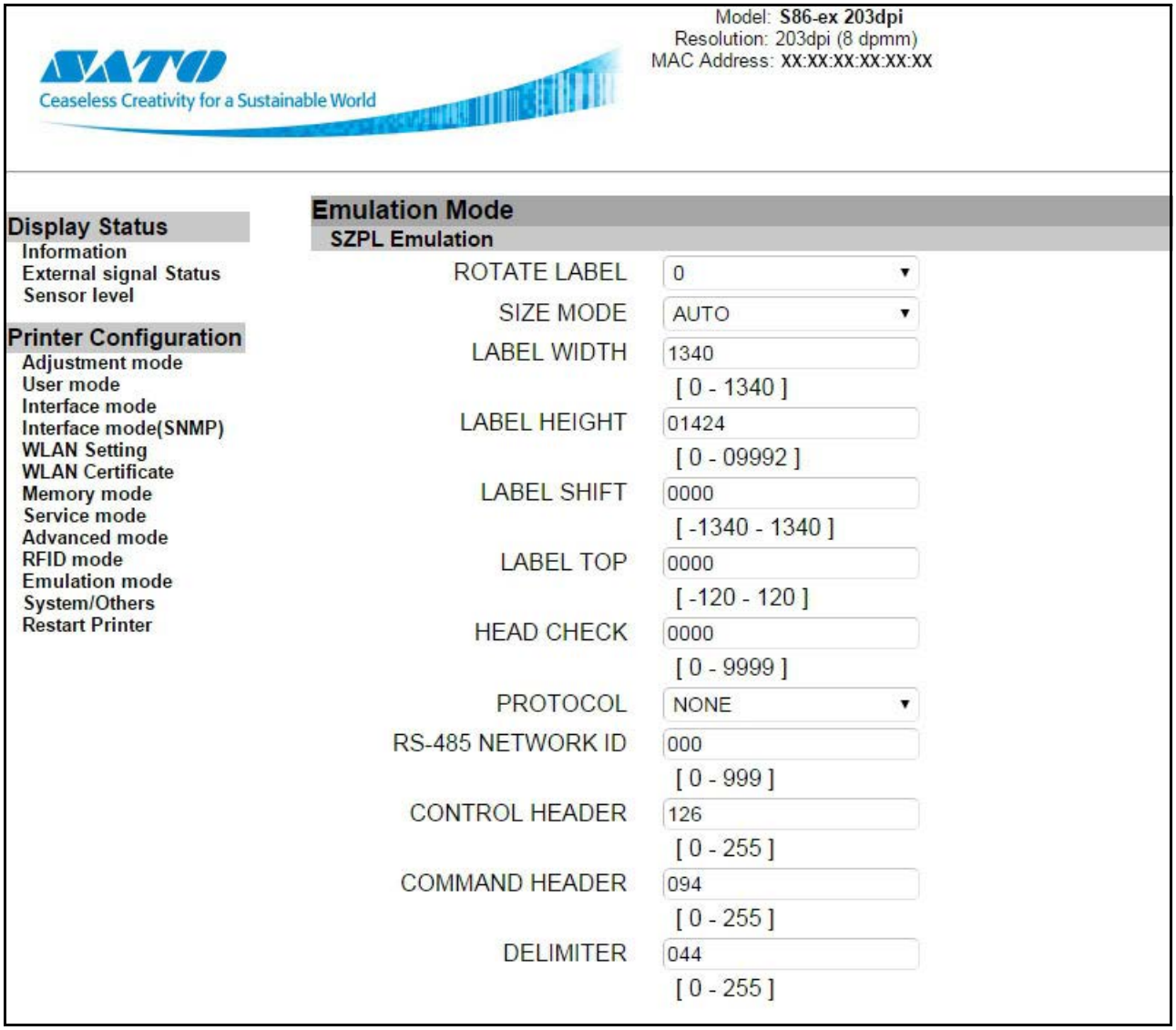
4.3.13 RFID Mode

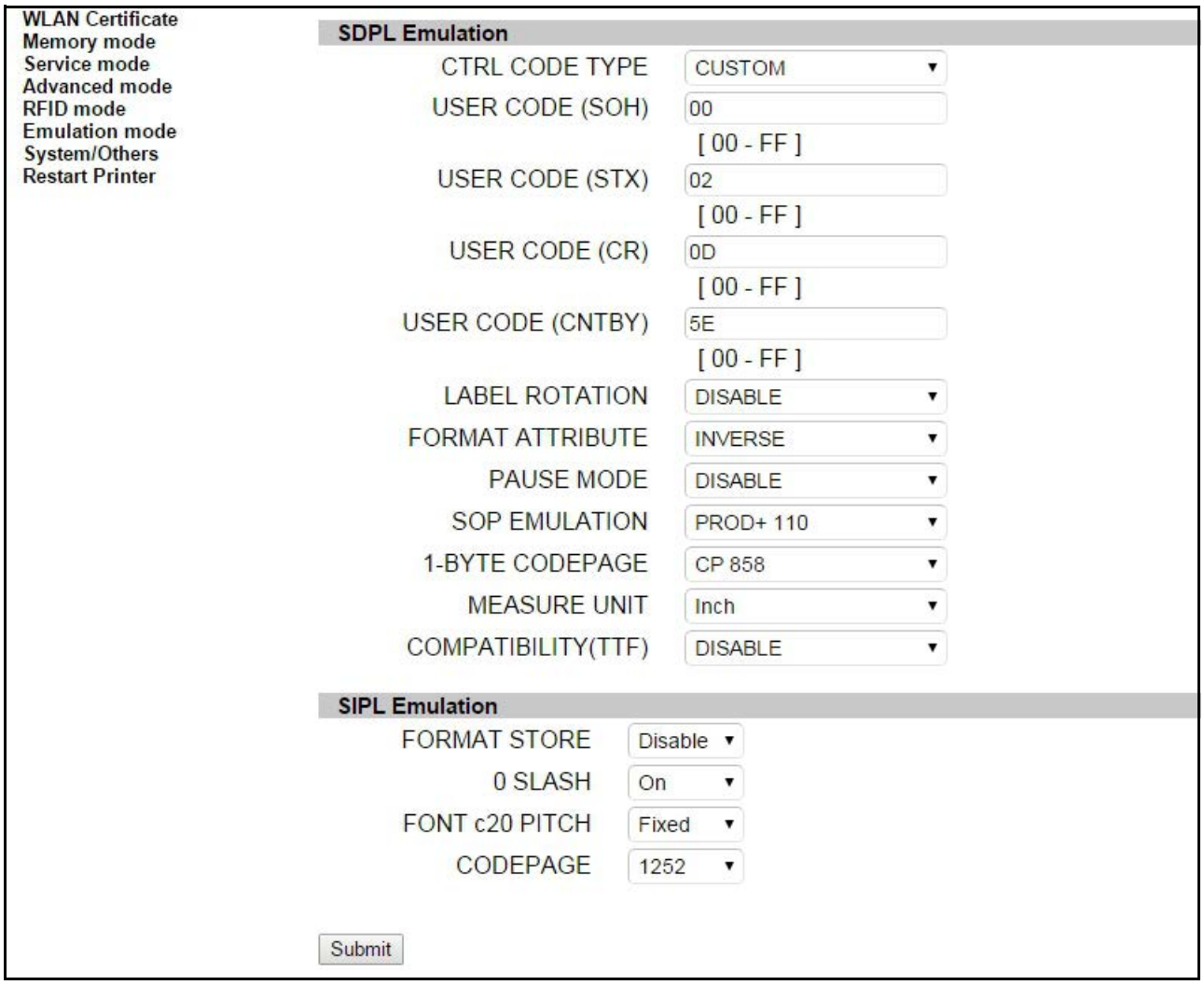
Login is required to view this page. Enter the correct user name and password to log in as shown in **Section 4.3.4 Adjustment Mode**.
After logging in, the RFID mode page is shown as follows.
Refer to **Section 2.1.4 RFID Mode** of the S84-ex/S86-ex service manual.



4.3.14 Emulation Mode

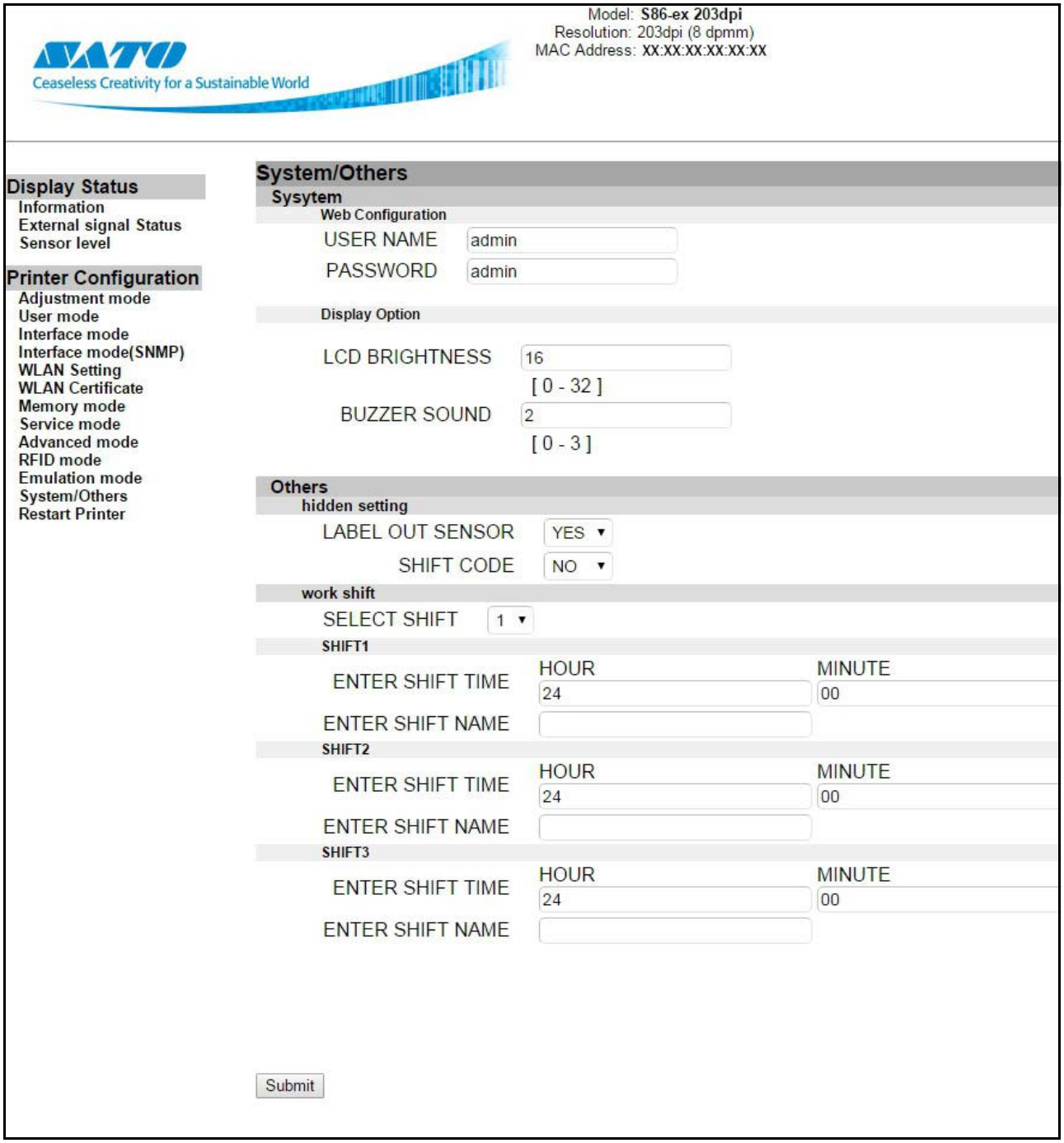
Login is required to view this page. Enter the correct user name and password to log in as shown in **Section 4.3.4 Adjustment Mode**.
After logging in, the Emulation mode page is shown as follows (continued to the next page).
Refer to **Section 5.2 SZPL Emulation Mode**, **Section 5.3 SDPL Emulation Mode** or **Section 5.4 SIPL Emulation Mode**.




WLAN Certificate
Memory mode
Service mode
Advanced mode
RFID mode
Emulation mode
System/Others
Restart Printer
SDPL Emulation
CTRL CODE TYPE
CUSTOM
USER CODE (SOH)
00
[00 - FF]
USER CODE (STX)
02
[00 - FF]
USER CODE (CR)
0D
[00 - FF]
USER CODE (CNTBY)
5E
[00 - FF]
LABEL ROTATION
DISABLE
FORMAT ATTRIBUTE
INVERSE
PAUSE MODE
DISABLE
SOP EMULATION
PROD+ 110
1-BYTE CODEPAGE
CP 858
MEASURE UNIT
Inch
COMPATIBILITY(TTF)
DISABLE
SIPL Emulation
FORMAT STORE
Disable
0 SLASH
On
FONT c20 PITCH
Fixed
CODEPAGE
1252
Submit

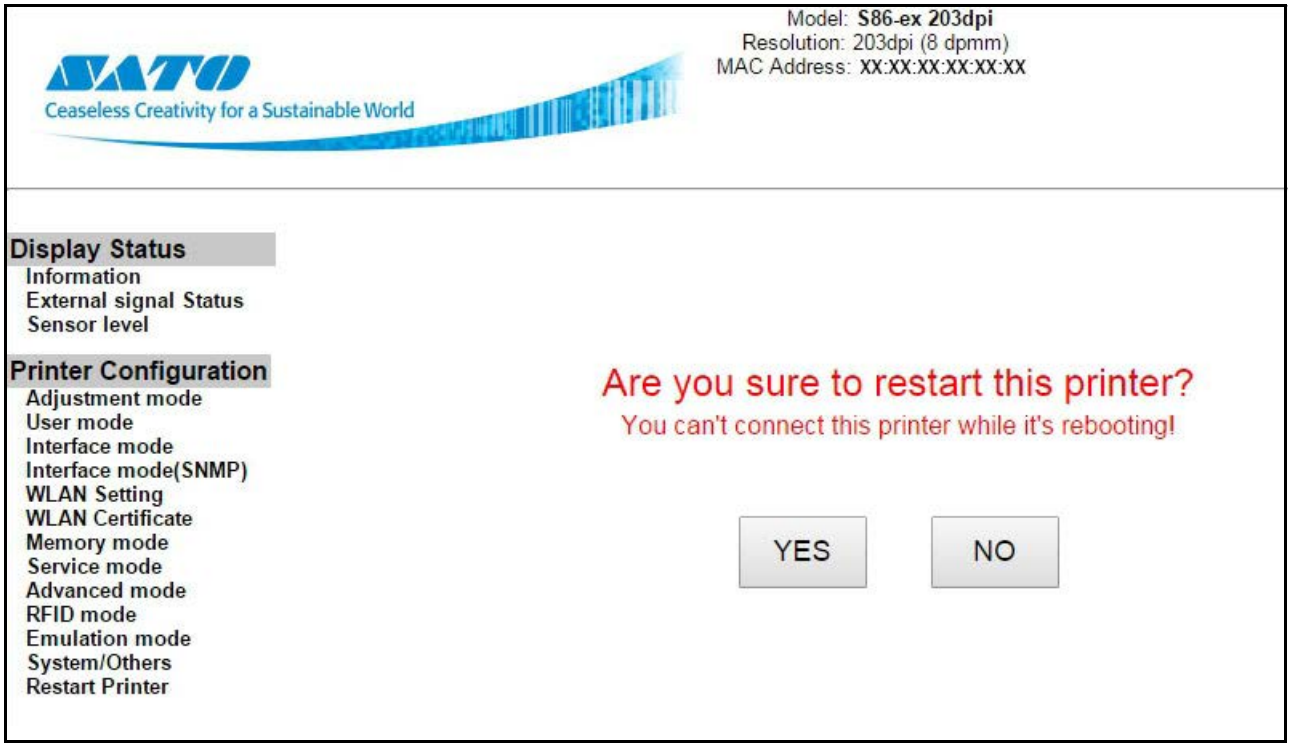
4.3.15 System/Others

Login is required to view this page. Enter the correct user name and password to log in as shown in **Section 4.3.4 Adjustment Mode**.
After logging in, the System/Others page is shown as follows.



4.3.16 Restart Printer

Login is required to view this page. Enter the correct user name and password to log in as shown in **Section 4.3.4 Adjustment Mode**.
After logging in, the page is shown as follows.



This page is intentionally left blank.

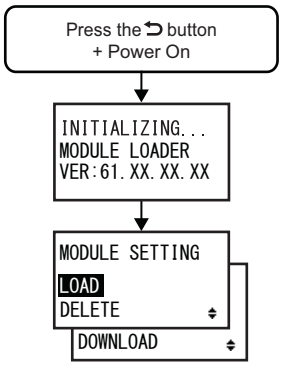
5 Emulation Mode

The emulation mode allows the S84-ex/S86-ex printer to function in virtually all legacy external party programming language environment without requiring modification to host data stream.

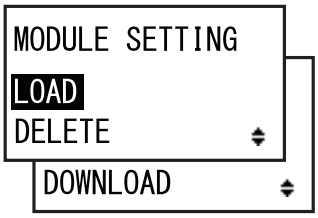
5.1 Emulation Module Loader

When the printer is started up with the emulation loader, user can load or delete the selected emulation module, or download emulation module.

The flowchart shows the sequence of the setting screens for the emulation loader.



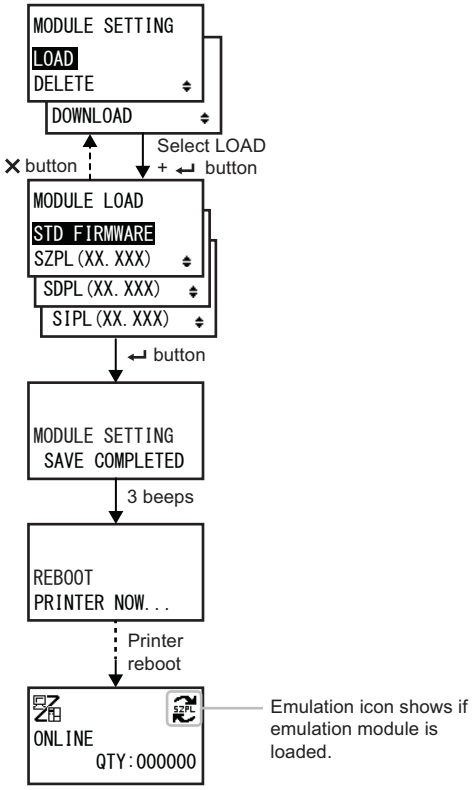
1 Press and hold the ⮌ **FUNCTION** button and power on the printer. Release the ⮌ **FUNCTION** button when the buzzer beeps.

MODULE SETTING	
Select the module loader function using the ▲/▼ buttons and then press the ↵ **ENTER** button. • **LOAD**: Load the standard firmware or emulation firmware. • **DELETE**: Delete the selected emulation module. • **DOWNLOAD**: Download the emulation firmware to the printer. **Note** If there is no emulation module downloaded to the printer memory, you cannot select the DELETE function.	

5.1.1 Loading the Emulation Module

In the emulation module loader, user can select to load the standard or emulation module. The valid downloaded emulation module is listed on the display. A total of four emulation modules can be downloaded to the printer memory. However, it is subject to the download area availability and other prevailing condition. The printer will not support SBPL command data printing while using the emulation module.

The flowchart shows the sequence of the setting screens for loading the emulation module. The table describes each setting screen in detail.

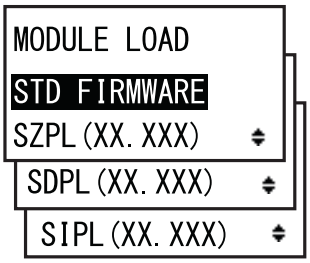


MODULE LOAD

Select the module to be loaded to the printer using the ▲/▼ buttons and then press the ↵ **ENTER** button.

- **STD FIRMWARE**: Load the standard firmware.
- **SZPL (XX.XXX)**: Load the downloaded SZPL emulation firmware.
- **SDPL (XX.XXX)**: Load the downloaded SDPL emulation firmware.
- **SIPL (XX.XXX)**: Load the downloaded SIPL emulation firmware.

Note
The XX.XXX is the module version information.



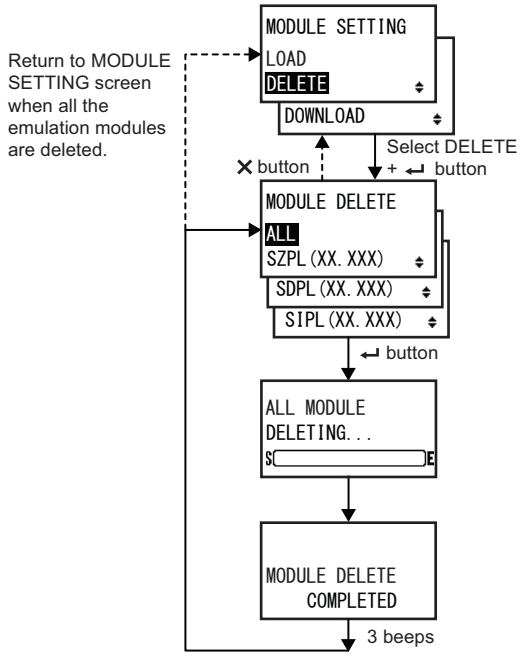
MODULE SETTING SAVE COMPLETED	
This screen shows the completion of saving the module setting and three beeps will sound.	

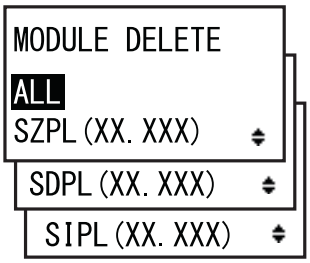
REBOOT PRINTER NOW...	
This screen shows the printer starts rebooting and start up the printer with the selected firmware loaded.	

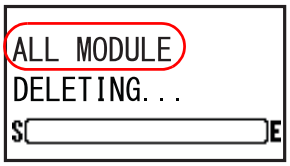
5.1.2 Deleting the Emulation Module

In the emulation module loader, user can delete the downloaded emulation module to free up memory space in the printer.

The flowchart shows the sequence of the setting screens for deleting the emulation module. The table describes each setting screen in detail.



MODULE DELETE	
Select the module to be deleted using the ▲/▼ buttons and then press the ↵ **ENTER** button. • **ALL**: Delete all the downloaded emulation firmware. • **SZPL (XX.XXX)**: Delete the downloaded SZPL emulation firmware. • **SDPL (XX.XXX)**: Delete the downloaded SDPL emulation firmware. • **SIPL (XX.XXX)**: Delete the downloaded SIPL emulation firmware. **Note** The XX.XXX is the module version information.	

ALL MODULE DELETING...	
The printer is deleting the selected emulation module. The bar on the lower portion of the screen indicates the module deletion progress. If **ALL** is selected in the previous screen, **ALL MODULE** is shown. Otherwise, the screen shows the selected emulation module name. For example, **SZPL(XX.XXX)** or **SDPL(XX.XXX)**. The XX.XXX is the module version information.	

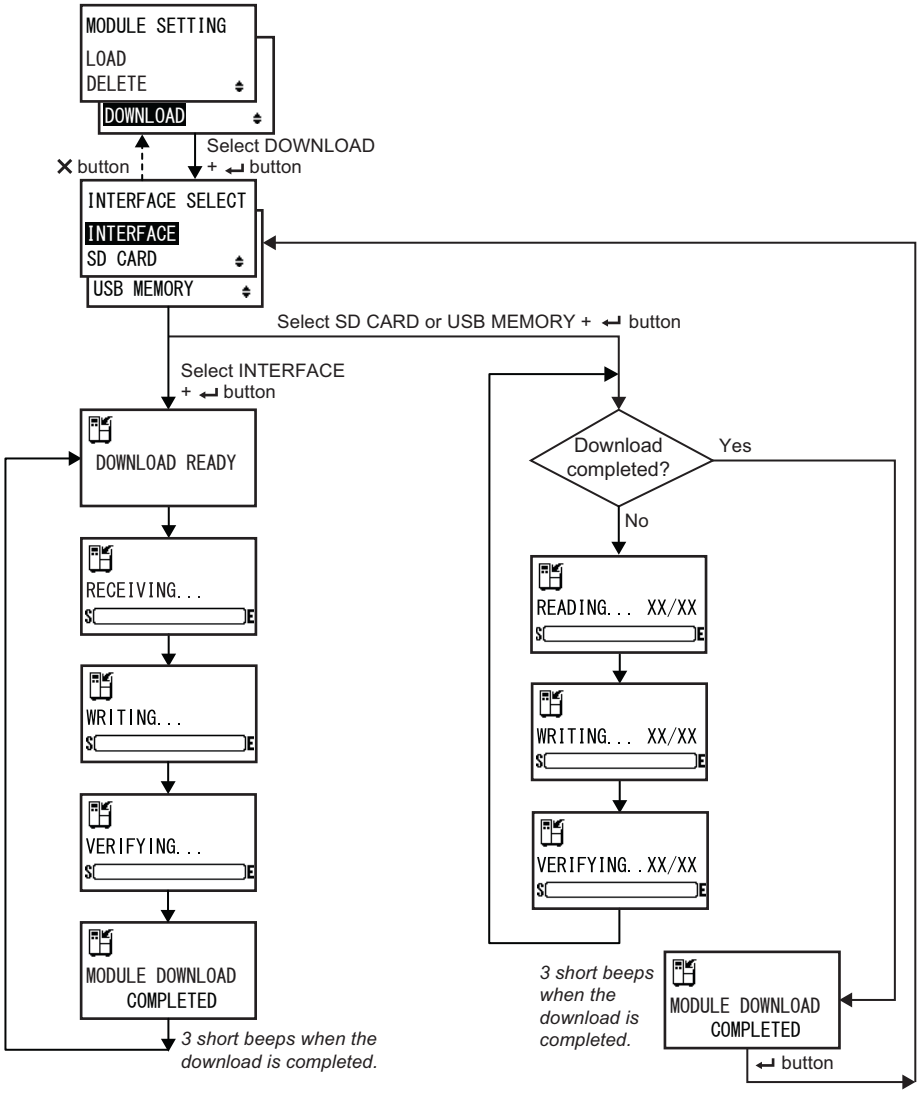
MODULE DELETE COMPLETED	
This screen shows the completion of deleting the selected emulation module and three beeps will sound. If there is emulation module in the printer memory, the printer shows the **MODULE DELETE** menu. If all the emulation module has been deleted, the printer shows the **MODULE SETTING** menu.	

5.1.3 Downloading the Emulation Module

In the emulation module loader, user can download the emulation module. A total of four emulation modules can be downloaded to the printer memory.
The flowchart shows the sequence of the setting screens for loading the emulation module. The table describes each setting screen in detail.

⚠ CAUTION

Be sure to perform a virus check for the USB memory or SD card before connecting it to the printer. SATO Corporation shall not be held responsible for a malfunction of the printer caused by a virus infection through the USB memory or SD card.



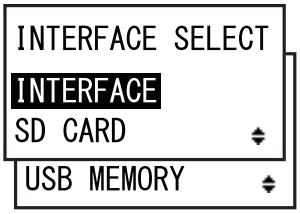
Note

Firmware download may fail if there is insufficient download area for the emulation modules. Delete the unnecessary emulation module from the printer memory to free up memory space for the new emulation module download.

INTERFACE SELECT

Select the download method.

- **INTERFACE**: Download the emulation module from the interface.
- **SD CARD**: Download the emulation module from an SD card.
- **USB MEMORY**: Download the emulation module from a USB memory.



DOWNLOAD READY

The printer is waiting to receive module data using the selected interface, which set by DATA PORT in the Interface mode menu.

Note
Shows only if INTERFACE SELECT is set to INTERFACE.



RECEIVING...

The printer is receiving the module data.
The bar on the lower portion of the screen indicates the data reception progress.
After receiving the module data, it goes to the WRITING… screen.

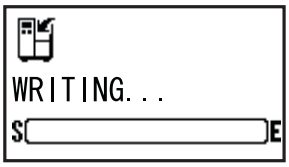
Note
Shows only if INTERFACE SELECT is set to INTERFACE.



WRITING...

The printer is writing the module data.
The bar on the lower portion of the screen indicates the data writing progress.
After writing the module data, it goes to the VERIFYING… screen.

Note
Shows only if INTERFACE SELECT is set to INTERFACE.



VERIFYING...

The printer is verifying the module data.
The bar on the lower portion of the screen indicates the data verification progress.
After verifying the module data, it goes to the MODULE DOWNLOAD COMPLETED screen.

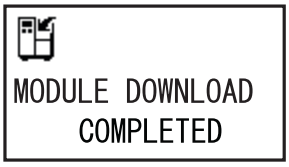
Note
Shows only if INTERFACE SELECT is set to INTERFACE.



MODULE DOWNLOAD COMPLETED

This screen shows the completion of the download.
Three beeps will sound when the module download is completed.
If downloading through INTERFACE, it will return to the DOWNLOAD READY screen.

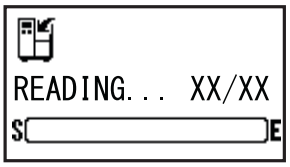
If downloading through SD CARD or USB MEMORY, press the ↵ **ENTER** button to return to the INTERFACE SELECT screen.



READING... XX/XX

The printer is reading the module data.
The bar on the lower portion of the screen indicates the data reading progress.
XX/XX shows the file number being read and total number of files.
After reading the module data, it goes to the WRITING… screen.

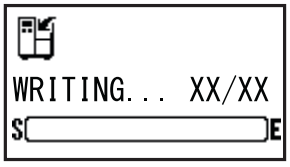
Note
Shows only if INTERFACE SELECT is set to SD CARD or USB MEMORY.

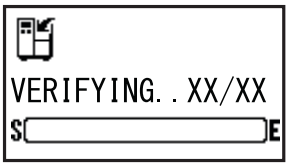


WRITING... XX/XX

The printer is writing the module data.
The bar on the lower portion of the screen indicates the data writing progress.
XX/XX shows the file number being read and total number of files.
After writing the module data, it goes to the VERIFYING… screen.

Note
Shows only if INTERFACE SELECT is set to SD CARD or USB MEMORY.

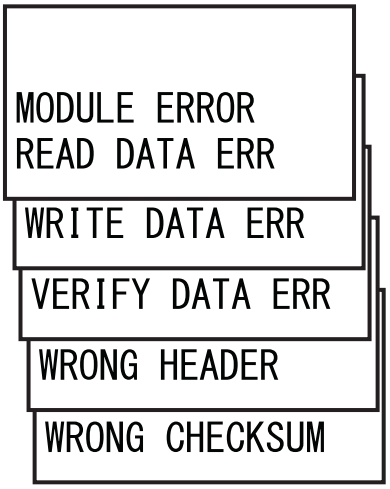


VERIFYING... XX/XX	
The printer is verifying the module data. The bar on the lower portion of the screen indicates the data verification progress. XX/XX shows the file number being read and total number of files. After verifying the module data, it goes to the MODULE DOWNLOAD COMPLETED screen. **Note** Shows only if INTERFACE SELECT is set to SD CARD or USB MEMORY.	

5.1.4 Emulation Module Error

If error occurred during module loading or deleting process, the screen shows the error massage, MODULE ERROR and the cause of the error as listed below.

- READ DATA ERR
- WRITE DATA ERR
- VERIFY DATA ERR
- WRONG HEADER
- WRONG CHECKSUM



When read data error, write data error or verify data error occurred, update the emulation loader firmware or change the FLASH ROM device.
When wrong header or wrong checksum error occurred, delete the emulation module and then download the emulation module firmware again.

If error occurred during module downloading, the screen shows the error massage, DOWNLOAD DATA ERROR.



The possible causes of module download error are:

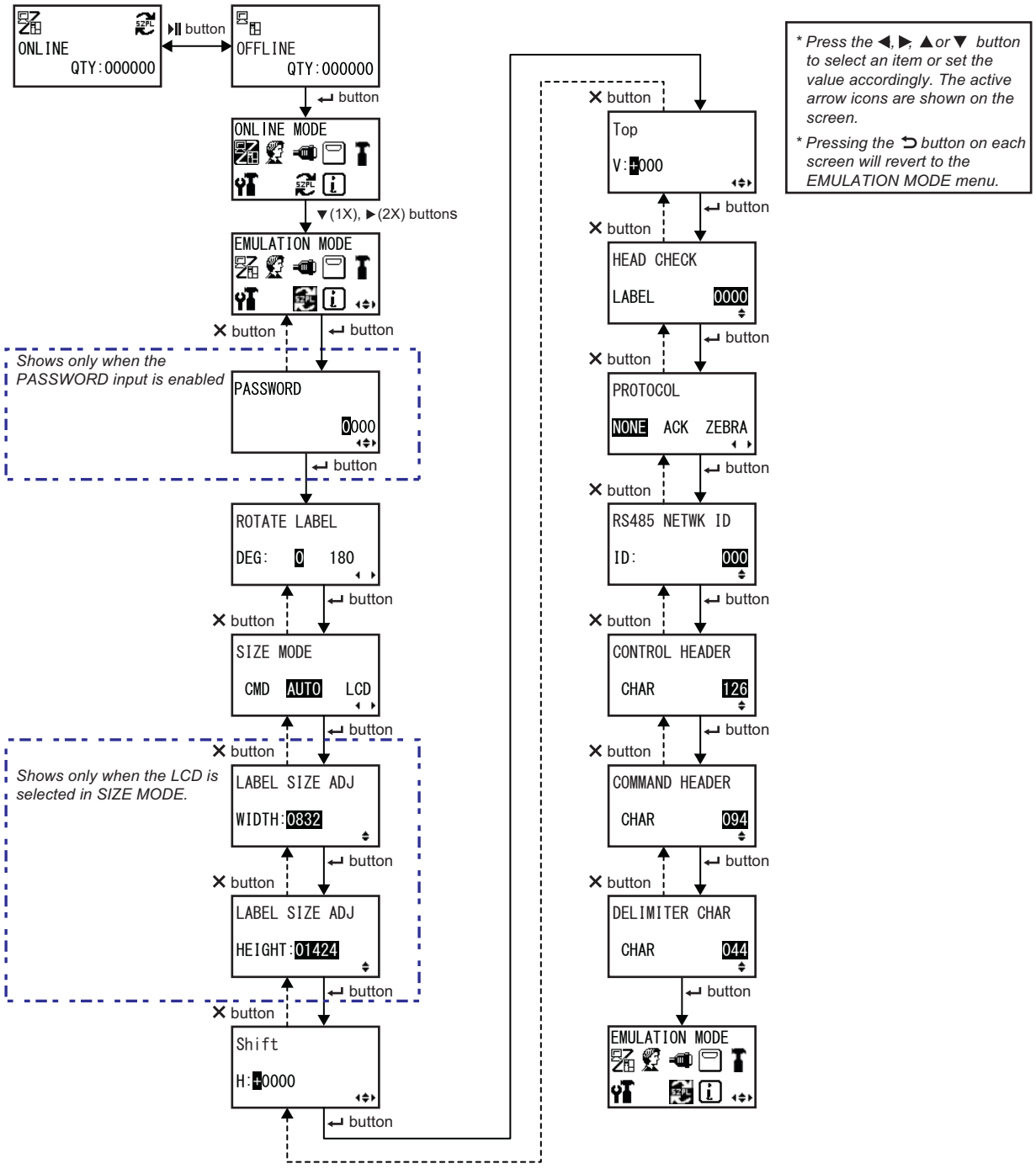
- Module header error.
- Not enough memory space or the module size is too big.

When the module download error occurred,

- Check the module header information.
- Delete the old module.
- Delete the unused module.

5.2 SZPL Emulation Mode

The SZPL Emulation Mode is available when the printer is loaded with SZPL Emulation firmware. The RFID option is not supported in this emulation firmware.
The flowchart shows the sequence of the setting screens for the SZPL emulation firmware. The table describes each setting screen in detail.



ROTATE LABEL

Set the rotation for printing.

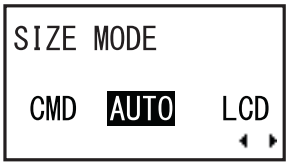
- **0**: Print the media as usual without rotation.
- **180**: Print the media with 180 degree rotation.



SIZE MODE

Set the label size adjustment control.

- **CMD**: The label size is set by command.
- **AUTO**: The label size is measured automatically by the printer.
- **LCD**: The label size is set by the following screen.



Note
When AUTO is selected, the printer will automatically feed two blank labels to check the label size. The printer will perform the checking function when SZPL emulation mode active in the following scenarios:

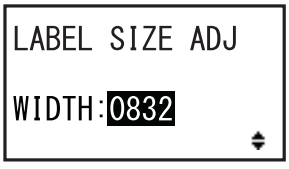
- Printer power on (Initial feed setting must be enabled in Service mode).
- After head open error clearance.
- When switching from SBPL mode to SZPL emulation mode.
- When change the size mode to AUTO from other mode.

If AUTO ONLINE FEED under Service mode is set to NO, SIZE MODE will switch to CMD automatically. The label size setting will be override by the Label Width ^PW or Label Length ^LL Zebra command if it is specify within the data stream regardless of the current Size Mode setting (for example AUTO/LCD).

LABEL SIZE ADJ WIDTH

Set the width of the media.
The setting range varies depending on the following model:

Model	Setting Range (dot)
S84-ex (203 dpi)	0000 to 0832
S84-ex (305 dpi)	0000 to 1248
S84-ex (609 dpi)	0000 to 2496
S86-ex (203 dpi)	0000 to 1340
S86-ex (305 dpi)	0000 to 2010



Note
Shows only if SIZE MODE is set to LCD.

LABEL SIZE ADJ HEIGHT

Set the height of the media.
The setting range varies depending on the following model:

Model	Setting Range (dot)
S84-ex (203 dpi)	00000 to 20000
S84-ex (305 dpi)	00000 to 18000
S84-ex (609 dpi)	00000 to 09600
S86-ex (203 dpi)	00000 to 09992
S86-ex (305 dpi)	00000 to 14988

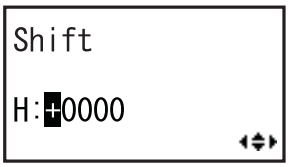
Note
Shows only if SIZE MODE is set to LCD.



Shift

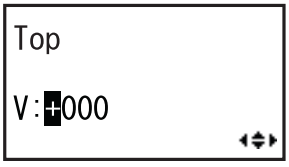
Set the shift offset position of the label.
The setting range varies depending on the following model:

Model	Setting Range (dot)
S84-ex (203 dpi)	-0832 to +0832
S84-ex (305 dpi)	-1248 to +1248
S84-ex (609 dpi)	-2496 to +2496
S86-ex (203 dpi)	-1340 to +1340
S86-ex (305 dpi)	-2010 to +2010



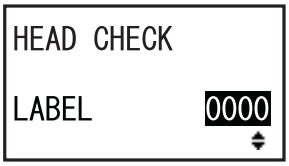
Top

Set the top offset position of the label.
The setting range is from -120 to +120.
The measurement unit is in dot.



HEAD CHECK

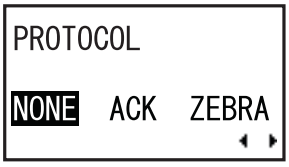
Specify the number of media between each head check.
The setting range is from 0000 to 9999.
The head check function is disabled when the value is set to 0000.



PROTOCOL

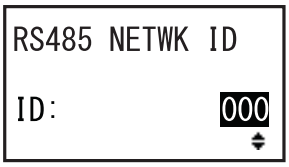
Set the SZPL communication protocol.

- **NONE**
- **ACK**
- **ZEBRA**



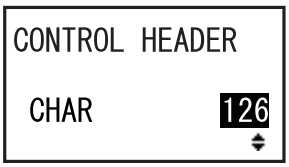
RS485 NETWK ID

Set the RS485 network ID.
The setting range is from 000 to 999.
The network is not in used when the ID is set to 000.



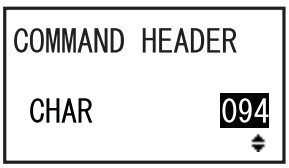
CONTROL HEADER

Set the control header character.
The setting range is from 000 (00H) to 255 (FFH).



COMMAND HEADER

Set the command header character.
The setting range is from 000 (00H) to 255 (FFH).



DELIMIT CHAR	
Set the delimit character. The setting range is from 000 (00H) to 255 (FFH).	

5.2.1 Auto Emulation Mode Switching Function

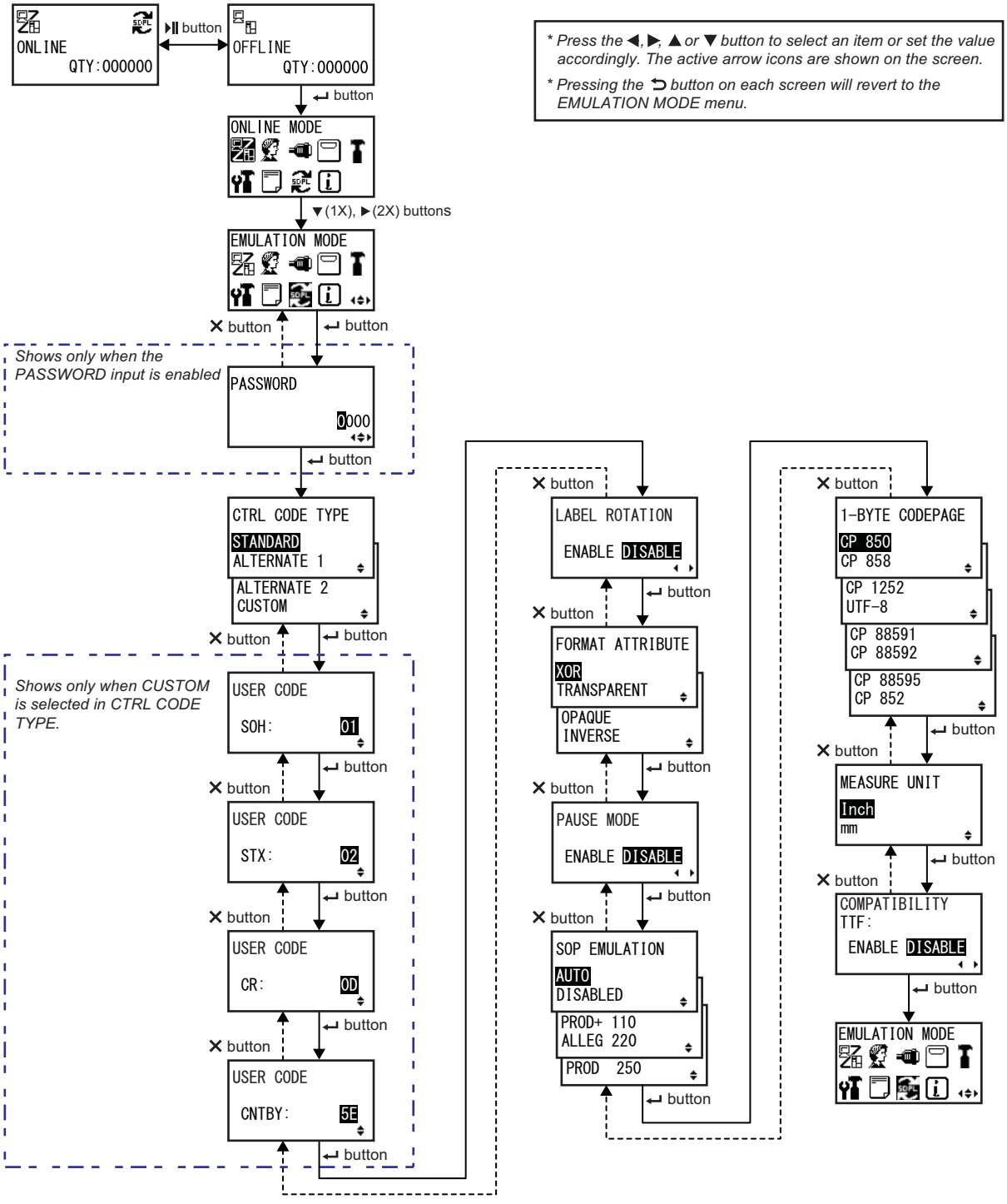
Auto emulation mode switching function is added to the SZPL emulation firmware to allow users to easily switch modes from SBPL to SZPL and vice-versa. The printer will automatically detect the type of data stream it received from the user and automatically switch to the appropriate mode (SBPL mode or SZPL mode). The auto emulation mode switching function can be disabled by using the <EMU> command.

Note

Due to the S84-ex/S86-ex emulation module design, the standard SBPL functionality have been removed and the firmware only support minimum set of commands such as ENQ, SOH commands or Test print commands to work with the AIOT printer management tool continuously. If full functionality is required, select the STD firmware module from emulation module loader.

5.3 SDPL Emulation Mode

The SDPL Emulation Mode is available when the printer is loaded with SDPL Emulation firmware. The RFID option is not supported in this emulation firmware.
The flowchart shows the sequence of the setting screens for the SDPL emulation firmware. The table describes each setting screen in detail.



** Press the ◀, ▶, ▲ or ▼ button to select an item or set the value accordingly. The active arrow icons are shown on the screen.*

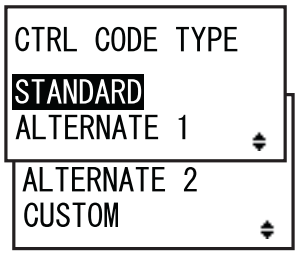
** Pressing the ⮌ button on each screen will revert to the EMULATION MODE menu.*

CTRL CODE TYPE

Set the control code type.
The options are as follows:

- **STANDARD**
- **ALTERNATE 1**
- **ALTERNATE 2**
- **CUSTOM**

STANDARD, ALTERNATE 1, and ALTERNATE 2 have control codes preset. User can set the value for control codes if CUSTOM is selected.



USER CODE SOH

Set the SOH code.

The setting range is from 00 to FF (hexadecimal).
Three beeps will sound, indicating error, if the value is identical with other codes (STX, CR, CNTBY).

Note
Shows only if CTRL CODE TYPE is set to CUSTOM.

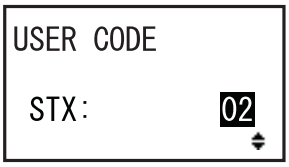


USER CODE STX

Set the STX code.

The setting range is from 00 to FF (hexadecimal).
Three beeps will sound, indicating error, if the value is identical with other codes (SOH, CR, CNTBY).

Note
Shows only if CTRL CODE TYPE is set to CUSTOM.

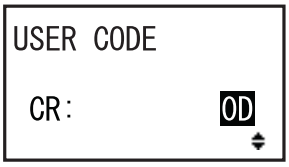


USER CODE CR

Set the CR code.

The setting range is from 00 to FF (hexadecimal).
Three beeps will sound, indicating error, if the value is identical with other codes (SOH, STX, CNTBY).

Note
Shows only if CTRL CODE TYPE is set to CUSTOM.

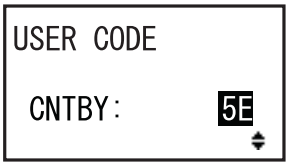


USER CODE CNTBY

Set the CNTBY code.

The setting range is from 00 to FF (hexadecimal).
Three beeps will sound, indicating error, if the value is identical with other codes (SOH, STX, CR).

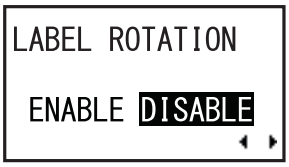
Note
Shows only if CTRL CODE TYPE is set to CUSTOM.



LABEL ROTATION

Set the page orientation of label printing.

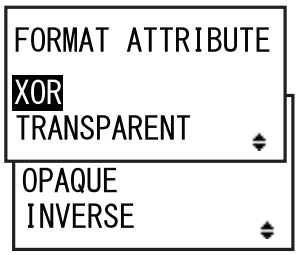
- **ENABLE**: Labels are printed in inverse-portrait orientation. The image will be printed as 180 degree rotation.
- **DISABLE**: Labels are printed in normal portrait orientation.



FORMAT ATTRIBUTE

Set the format attribute.
The options are as follows:

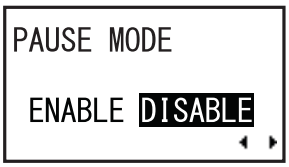
- **XOR**
- **TRANSPARENT**
- **OPAQUE**
- **INVERSE**



PAUSE MODE

Enable or disable the pause mode.

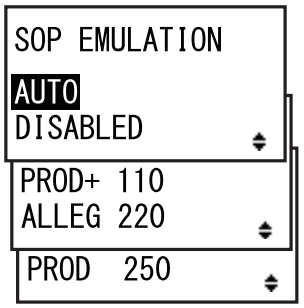
- **ENABLE**: Enable the pause mode. The printer enters offline mode after every print job if priority setting is set to LCD. It has the same effect as <STX>J.
- **DISABLE**: Disable the pause mode.



SOP EMULATION

Set the types of Start of Print (SOP) emulation.
The options are as follows:

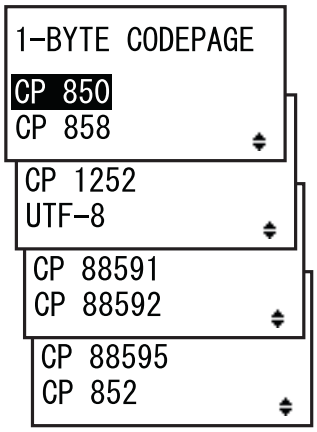
- **AUTO**: Auto selection based on the value set in <STX>O command.
- **DISABLED**: <STX>O command is ignored.
- **PROD+ 110**: Offset will be set by minus 110.
- **ALLEG 220**: Offset will be set by minus 220.
- **PROD 250**: Offset will be set by minus 250.



1-BYTE CODEPAGE

Select the code page to be used for 1 byte characters from the list.
The options are as follows:

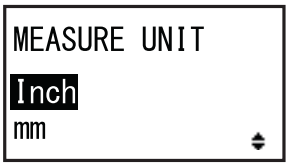
- **CP 850**
- **CP 858**
- **CP 1252**
- **UTF-8**
- **CP 88591**
- **CP 88592**
- **CP 88595**
- **CP 852**



MEASURE UNIT

Set the measurement unit.

- **Inch**
- **mm**



COMPATIBILITY TTF

Set whether to allow the use of TrueType font compatible mode.

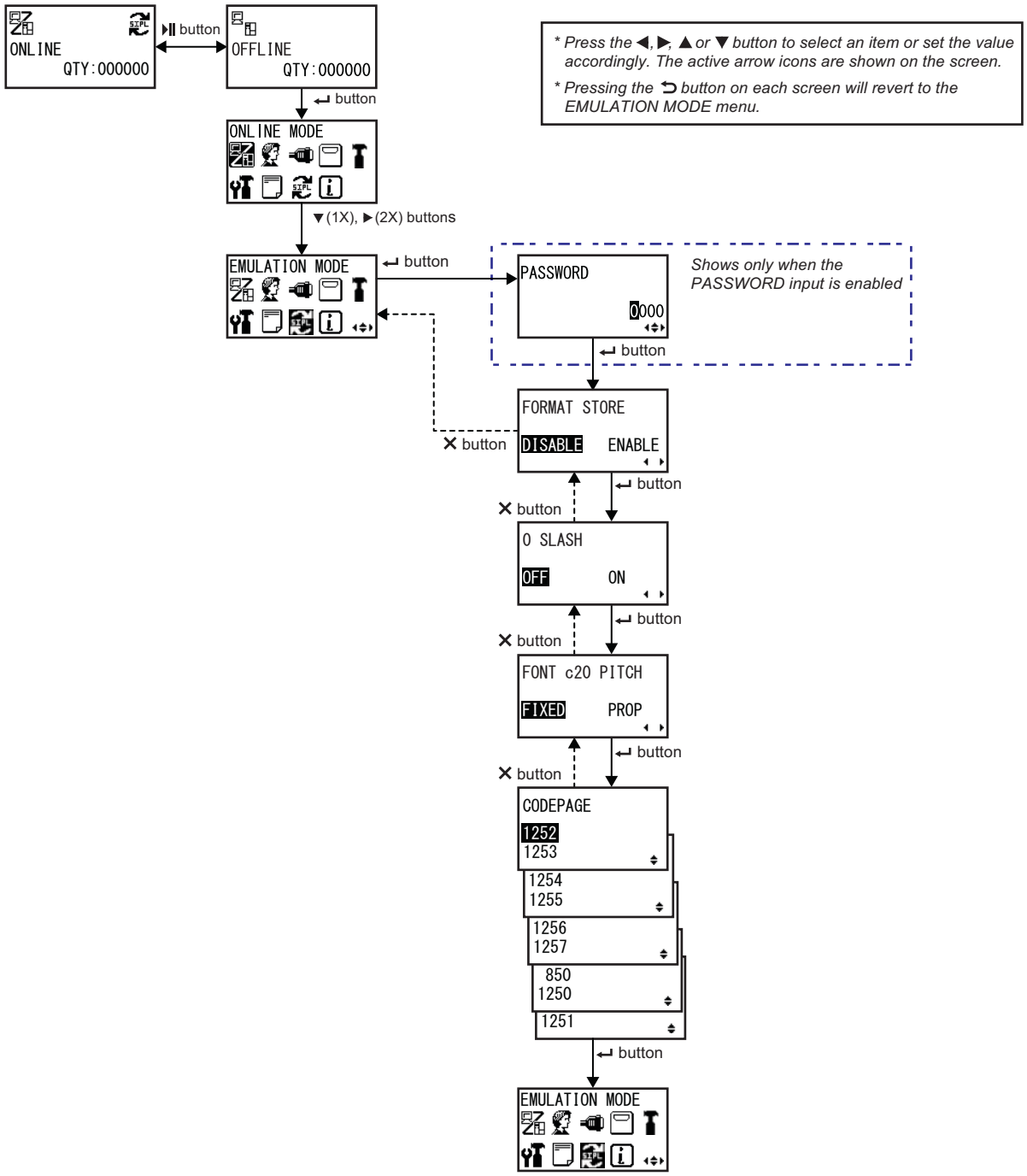
- **ENABLE**: Allow the use of TrueType fonts.
- **DISABLE**: Do not allow the use of TrueType fonts.

By enabling the TrueType font compatible mode, the bold TrueType font will be printed in smaller pitch, and native graphic ‘F’ can be printed with line terminator omitted.



5.4 SIPL Emulation Mode

The SIPL Emulation Mode is available when the printer is loaded with SIPL Emulation firmware. The RFID option is not supported in this emulation firmware.
The flowchart shows the sequence of the setting screens for the SIPL emulation firmware. The table describes each setting screen in detail.



FORMAT STORE

Set whether to save the user format data registered at printing in the printer.
The options are as follows:

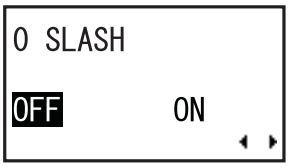
- **DISABLE**: Do not save the user format data registered at printing in the printer. The user format data remains in the printer memory until the printer is powered off. You need to register a user format again after reboot.
- **ENABLE**: Save the user format data registered at printing in the printer.



0 SLASH

Set whether to print the number zero (0) with or without a slash (/).
The options are as follows:

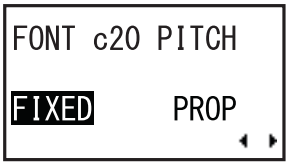
- **OFF**: Print zero without a slash.
- **ON**: Print zero with a slash.



FONT c20 PITCH

Set whether to print each character using a fixed pitch or proportional pitch spacing.
The options are as follows:

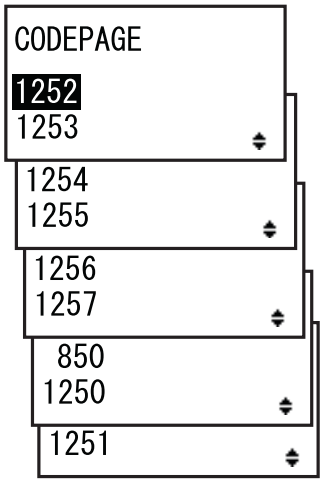
- **FIXED**: Print all characters with the fixed pitch.
- **PROP**: Print each character with proportional pitch spacing.



CODEPAGE

Select the code page to be used from the list.
The options are as follows:

- **1252**
- **1253**
- **1254**
- **1255**
- **1256**
- **1257**
- **850**
- **1250**
- **1251**



6 Cleaning and Performing Printer Adjustments

6.1 Maintenance

A dirty print head or platen roller not only affects the print quality but also causes errors. Use a cleaning kit or cleaning sheet to clean the printer regularly.

⚠ CAUTION

- Do not touch the power switch, connect or disconnect the power cord while your hands are wet. Doing so could cause an electric shock.
- Disconnect the power cord from the AC outlet before you begin cleaning.
  The print head and its surroundings are hot after printing. Wait until the printer cools down.
- Touching the edge of the print head with your bare hand could cause injury.
- Use a cleaning pen, cotton swab or cotton cloth from a cleaning kit to clean. Do not clean with a hard object. Doing so could cause damage.
- Remove the media and ribbon before cleaning.

Note

You can purchase a cleaning kit or cleaning sheet from a SATO reseller or technical service center.

6.2 Maintenance of the Print Head and Platen Roller

Maintenance should be performed at the following regular intervals:

- After you print one media roll or print media for one hundred and fifty meters.
  Use the cleaning kit to clean these parts:
  - Print head
  - Platen roller
  - Media sensors
  - Media guide

- After you print six media rolls or print media for nine hundred meters.
  Use the cleaning sheet to clean these parts:
  - Print head
  - Platen roller

  Use the cleaning kit to clean these parts:
  - Media guide
  - Feed roller
  - Media route
  - Ribbon route

Note

The above maintenance intervals are only for reference. Perform the cleaning when necessary.

6.2.1 Maintenance using the Cleaning Kit

The maintenance procedure using the cleaning kit is as follows:

Note

For details on the cleaning kit, refer to the manual attached to the cleaning kit.

1 Make sure that the printer is in power off mode, then disconnect the power cord from the AC outlet.

2 Open the **top cover**.

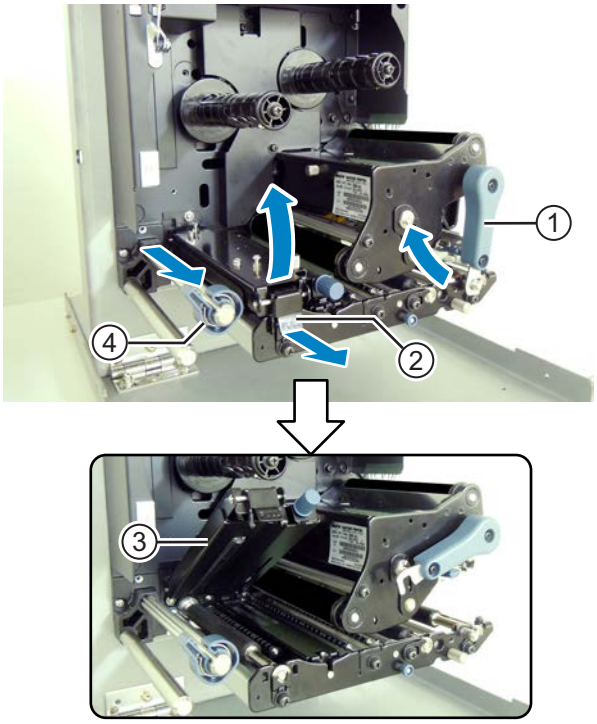
⚠ CAUTION

Open the top cover fully to prevent accidental drop of the cover.

3 Turn the **head lock lever** ① clockwise to unlock the print head.

⚠ CAUTION

- The print head and its surroundings are hot after printing. Be careful not to touch it, to avoid being burned.
- Touching the edge of the print head with your bare hand could cause injury.

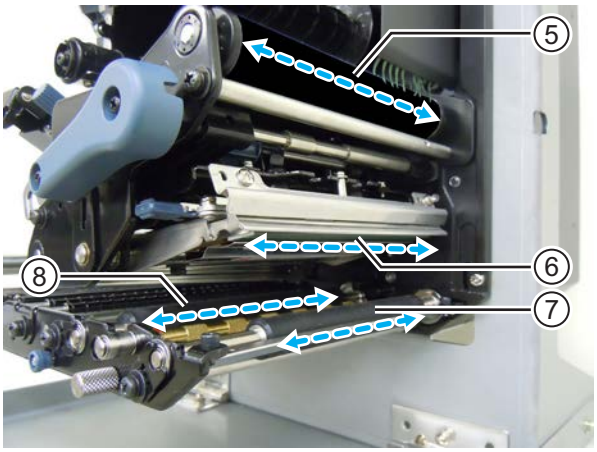


4 Pull the **feed lock latch** ② to unlock the **feed roller** and **media sensor assembly** ③.

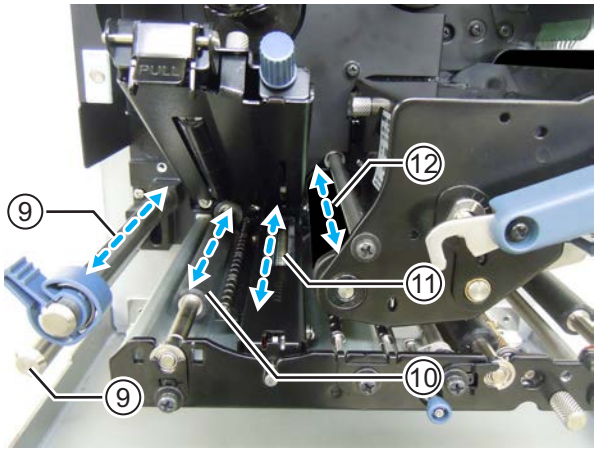
The feed roller and media sensor assembly flipped open.

5 Pull the **media guide** ④ away from the printer.

6 Clean the dirt on the **ribbon roller** ⑤, **print head** ⑥, **platen roller** ⑦ and **pressure roller** ⑧ using a cleaning pen or a cotton swab/cloth dabbed with cleaning liquid.

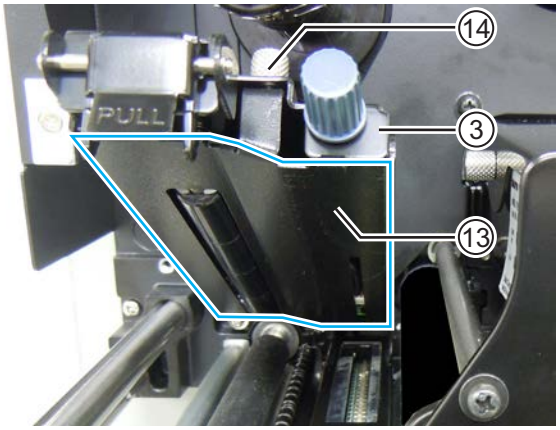


7 Clean the dirt on the **media shafts** ⑨, **feed roller** ⑩, **media sensor** ⑪ and **ribbon roller** ⑫ using a cleaning pen or a cotton swab/cloth dabbed with cleaning liquid.

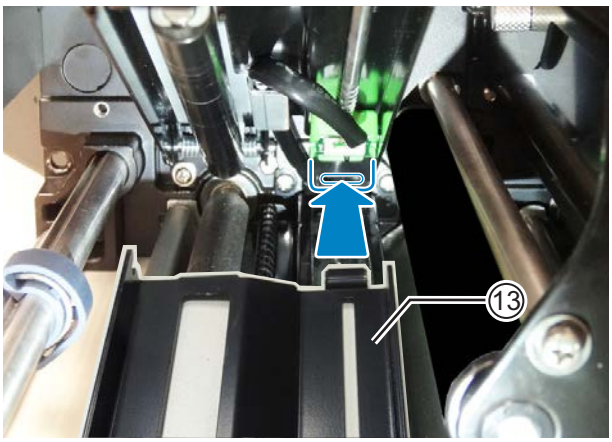


8 Clean the bottom of the **feed roller** and **media sensor assembly** ③ using the cotton cloth dabbed with cleaning liquid.

9 You can remove the **media sensor cover** ⑬ to clean the surface easily. Remove the **thumbscrew** ⑭ attached to the **media sensor cover**.

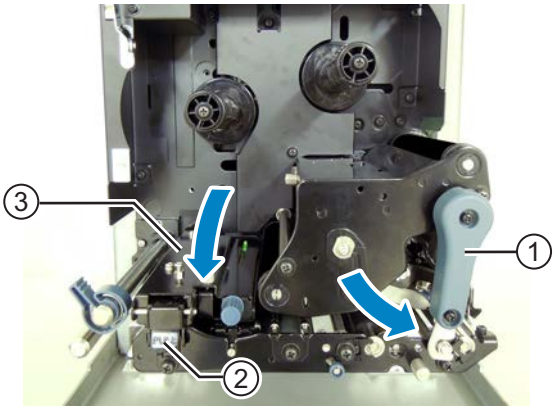


10 To assemble the **media sensor cover** ⑬, make sure that you insert the tab of the **media sensor cover** ⑬ to the slot as shown.
Then, attach the **media sensor cover** ⑬ using the **thumbscrew** ⑭.



11 Turn the **head lock lever** ① counterclockwise to lock the print head.

12 Press the **feed roller** and **media sensor assembly** ③ down until the **feed lock latch** ② is locked.



6.2.2 Maintenance using the Cleaning Sheet

The maintenance procedure using the cleaning sheet is as follows:

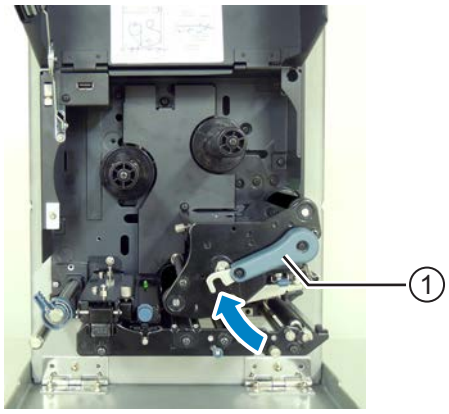
1 Make sure that the printer is in power off mode, then disconnect the power cord from the AC outlet.

2 Open the **top cover**.

⚠ CAUTION

Open the top cover fully to prevent accidental drop of the cover.

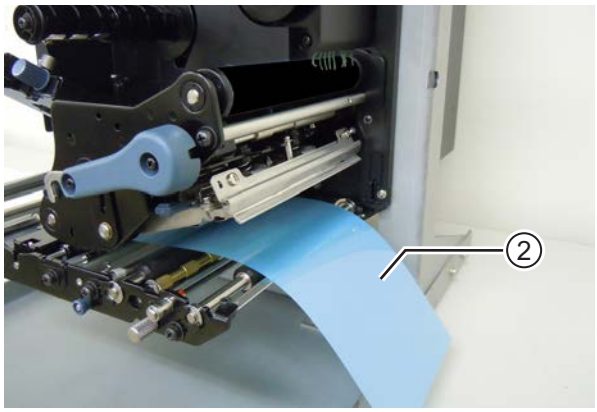
3 Turn the **head lock lever** ① clockwise to unlock the print head.



⚠ CAUTION

- The print head and its surroundings are hot after printing. Be careful not to touch it, to avoid being burned.
- Touching the edge of the print head with your bare hand could cause injury.

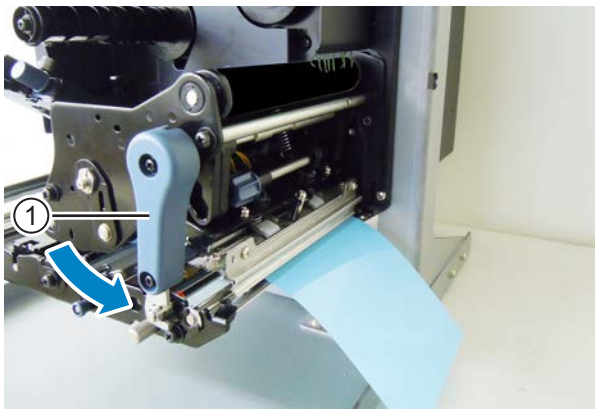
4 Place the **cleaning sheet** ② between the **print head** and the **platen roller**.



Note

Align the rough side of the cleaning sheet adjacent to the print head.

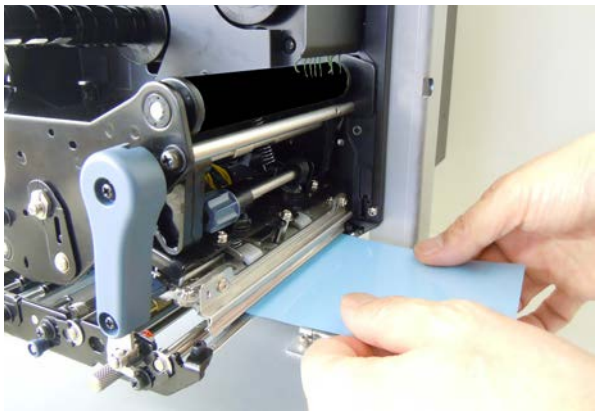
5 Turn the **head lock lever** ① counterclockwise to lock the print head.



6 Using two hands, pull the **cleaning sheet** away from the printer.

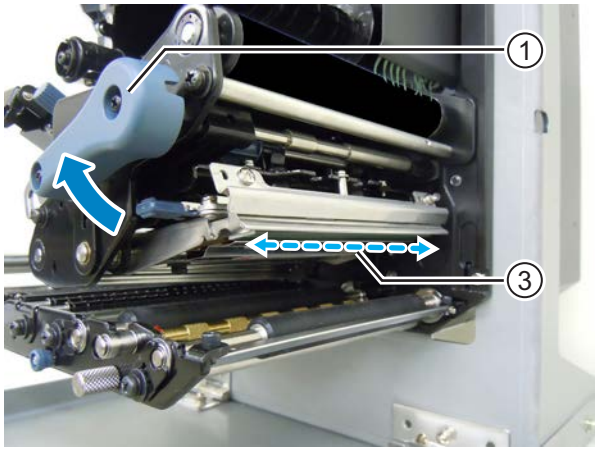
7 After you pull out the cleaning sheet, repeat steps 4 through 6, two or three more times.

When no more dirt appears on the cleaning sheet after you have pulled it out, stop repeating these steps.



8 Turn the **head lock lever** ① clockwise to unlock the **print head**.

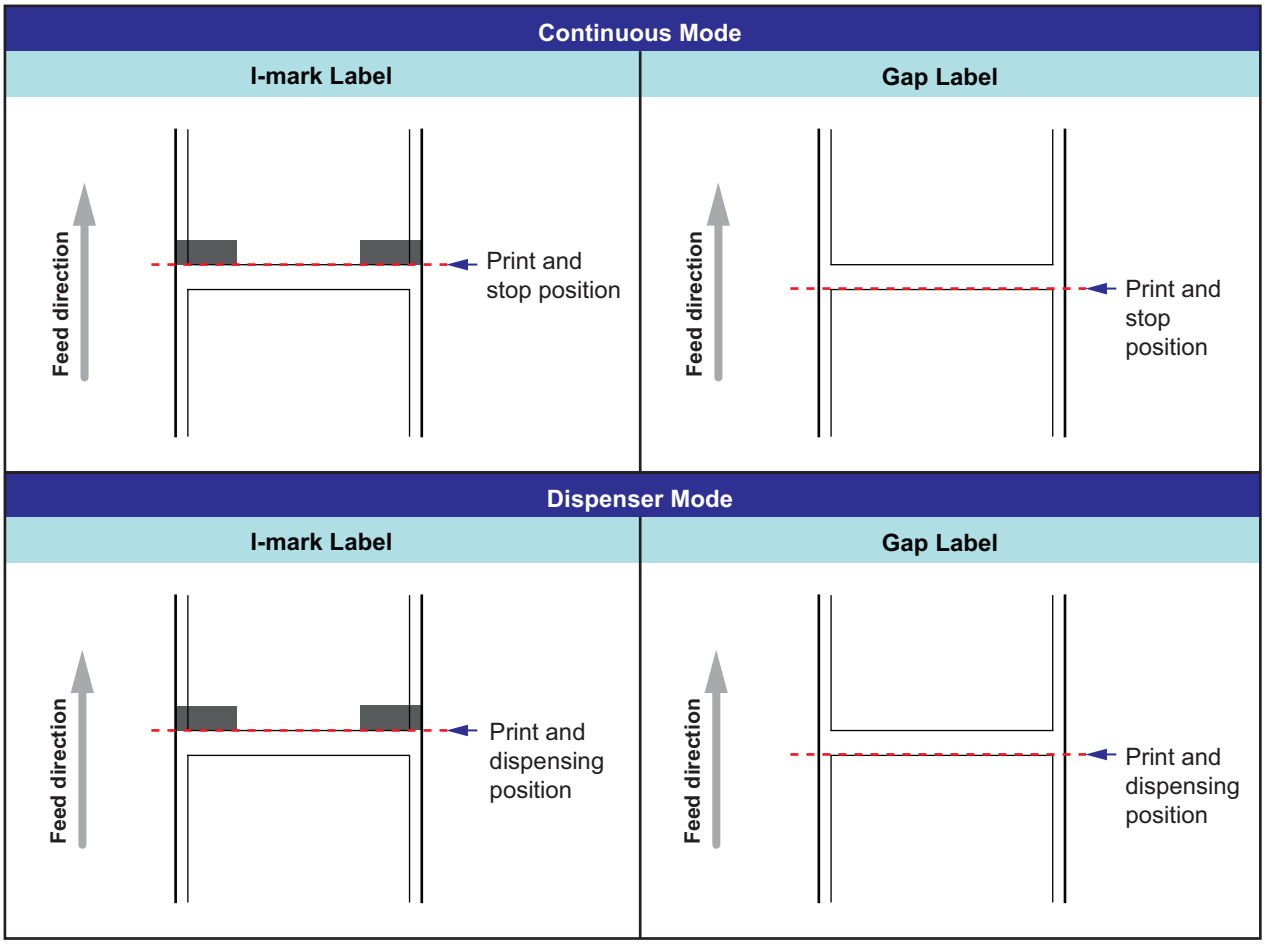
9 Use a **cleaning pen** to clean the dirt on the **print head** ③.



6.3 Adjusting the Base Reference Point

6.3.1 About the Base Reference Point

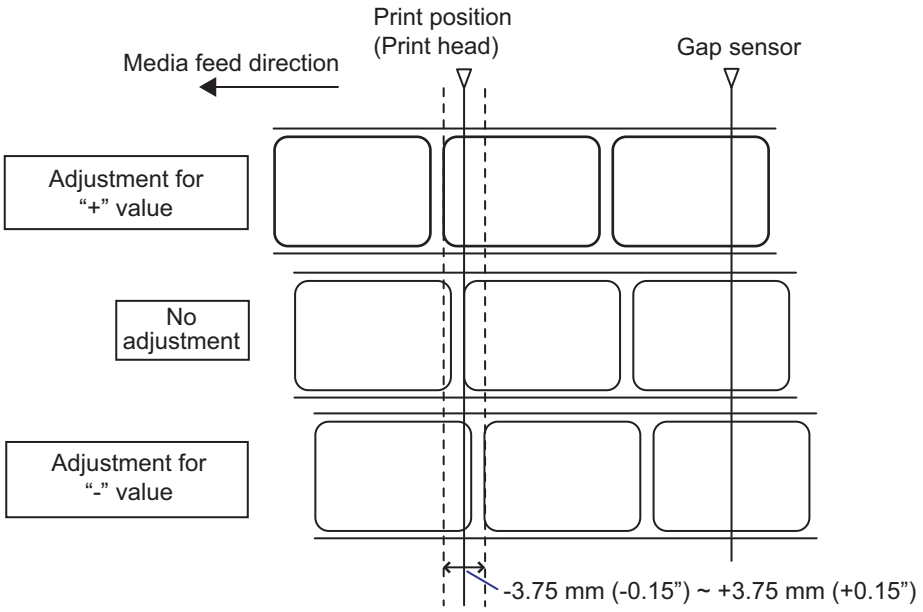
The base reference point is the point at which one determines the print position and stop/dispensing position.
The base reference point differs depending on the operation mode or media sensor you use.



6.3.2 Adjusting the Print Position

Adjustment Location	Adjustment Range
Adjustment Mode: Pitch Position	+3.75 mm to -3.75 mm (+0.15” to -0.15”)

Print position is adjustable within the range of +3.75 mm to -3.75 mm (+0.15” to -0.15”) in the adjustment mode described above. The shift experienced by the media, ribbon or print layout can be offset with the adjustment of the pitch position.



Note

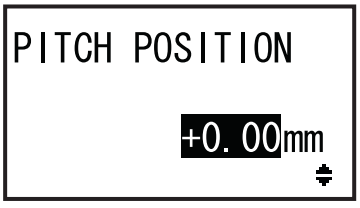
The above base reference point (print position) will be the stop position when the sensor type is set to Gap sensor.

Adjust the print position using the following procedure:

1 Make sure that the printer is in online mode or offline mode.

2 Press the ▲ and ▼ buttons for one second to enter the adjustment mode.

PITCH POSITION shows on the screen.



3 Change the setting value. Press the ▲/▼ buttons to set the desired value.

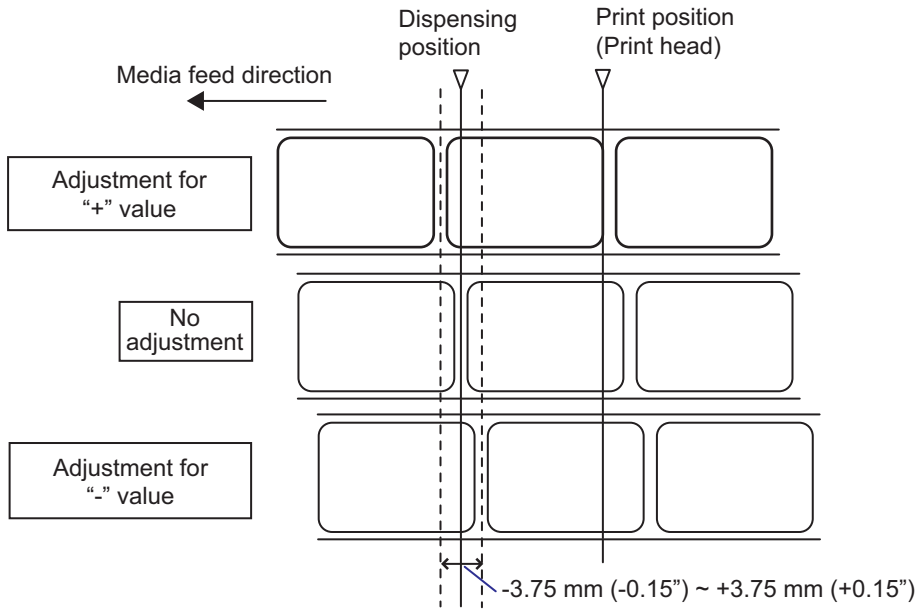
Set the offset value with '+' to move the print position opposite the feed direction, and value with '-' to move the print position in the feed direction.
The setting value is adjustable by 0.25 mm (0.01") regardless of print resolution.
The setting range is from -3.75 mm (-0.15") to +3.75 mm (+0.15").

4 Press the ↵ **ENTER** button to save the setting and go to the next adjustment screen.

6.3.3 Adjusting the Media Stop Position

Adjustment Location	**Adjustment Range**
Adjustment Mode: Offset Position	+3.75 mm to -3.75 mm (+0.15" to -0.15")

The stop position for options (such as Dispenser) is adjustable within the range of +3.75 mm to -3.75 mm (+0.15" to -0.15") in the adjustment mode described above.



Note

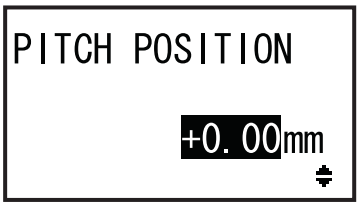
The above dispensing position for printing indicates the label stop position when the media sensor is set to Gap sensor.

Adjust the stop position using the following procedure:

1 Make sure that the printer is in online mode or offline mode.

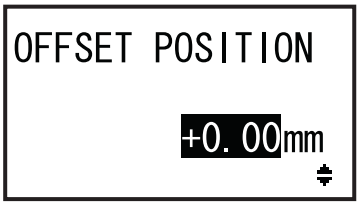
2 Press the ▲ and ▼ buttons for one second to enter the adjustment mode.

PITCH POSITION shows on the screen.



3 Press the ↵ **ENTER** button to go to the next adjustment screen.

OFFSET POSITION shows on the screen.



4 Change the setting value. Press the ▲/▼ buttons to set the desired value.

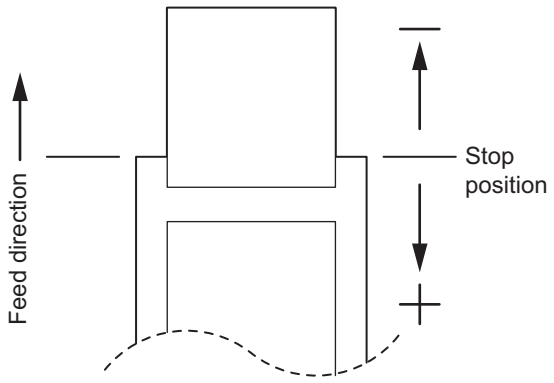
Set the offset value with '+' to move the stop position opposite the feed direction, and value with '-' to move the stop position in the feed direction.
The setting value is adjustable by 0.25 mm (0.01") regardless of print resolution.
The setting range is from -3.75 mm (-0.15") to +3.75 mm (+0.15").

5 Press the ↵ **ENTER** button to save the setting and proceed to the next adjustment screen.

6.3.4 More about the Media Stop Position

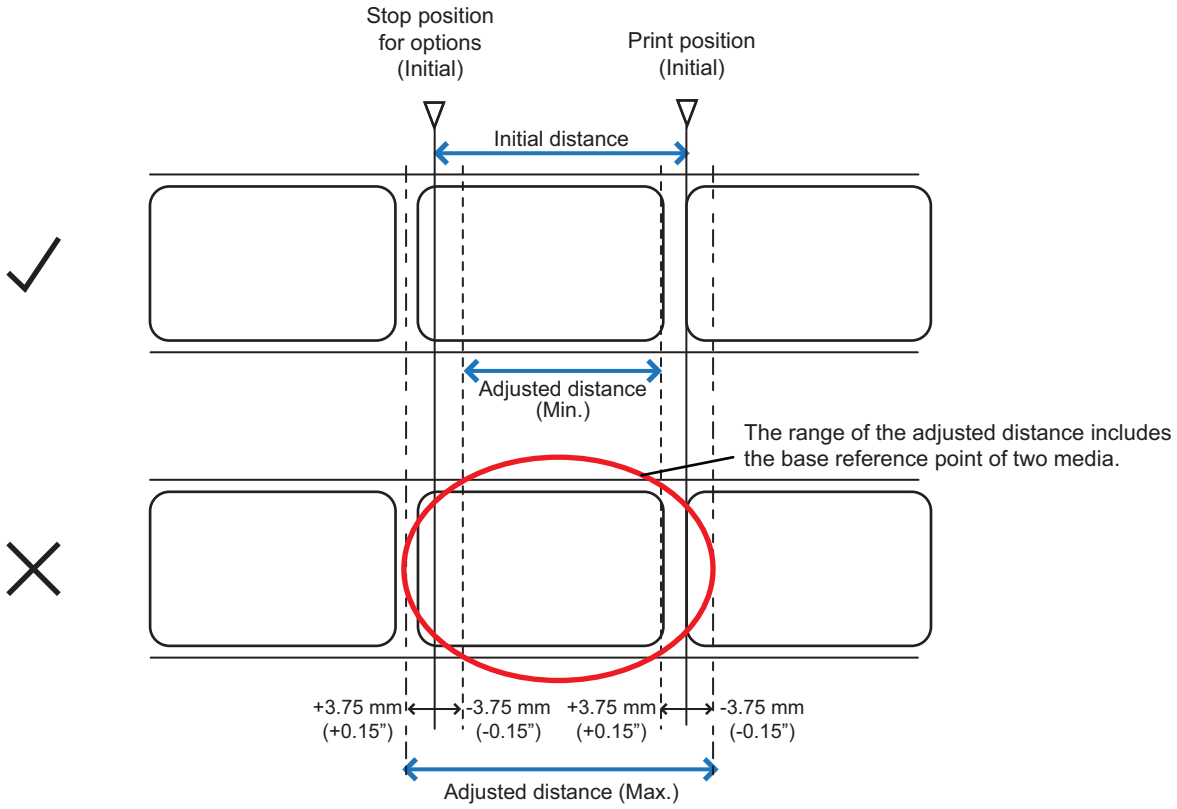
Stop position of the label in dispenser mode.

The regular position is to let the label stay about 1 mm (0.04") on the liner.



6.3.5 Limitation on Base Reference Point Adjustment

After adjusting the print position and stop position, the distance between these two positions should not exceed one pitch size (including liner) of the media.
Refer to the figure and table below for the adjustment range of the distance between the print position and the stop position for options.


Stop position for options (Initial)
Print position (Initial)
Initial distance
Adjusted distance (Min.)
The range of the adjusted distance includes the base reference point of two media.
+3.75 mm (+0.15")
-3.75 mm (-0.15")
+3.75 mm (+0.15")
-3.75 mm (-0.15")
Adjusted distance (Max.)

Adjustment range of the distance between the print position and the stop position for options:

Types of Options	Adjusted Distance (Min.)	Initial Distance	Adjusted Distance (Max.)
Dispenser	7.5 mm (0.3")	15.0 mm (0.6")	22.5 mm (0.9")

6.4 Adjusting the Print Quality

You can adjust the print quality by adjusting the print darkness and print speed.

6.4.1 Adjustment of the Print Darkness

The adjustment procedure for the print darkness is as follows:

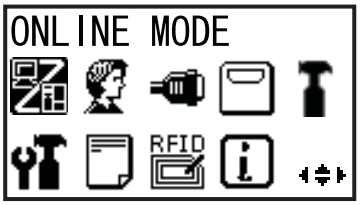
Note

You can fine tune the print darkness by setting the **DARKNESS** in the adjustments mode. Refer to **Section 4.2.5 Adjustment Mode** for details.

1 When the printer is in online mode, press the ⏯ **LINE** button to change the printer to offline mode.

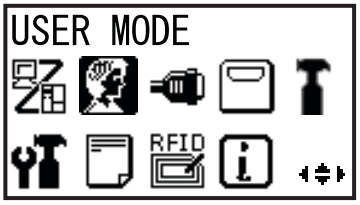
2 Press the ↵ **ENTER** button.

The printer changes to setting mode menu.



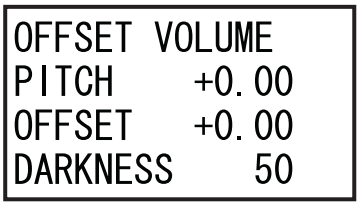
3 Select the **USER MODE** using the ▲/▼/◀/▶ buttons.

USER MODE shows on the screen and the icon is highlighted in reverse.



4 Press the ↵ **ENTER** button to enter the user mode.

OFFSET VOLUME shows on the screen.



Note

If password function is enabled, PASSWORD is shown on the screen instead. In this case, enter the password first.

5 Press the ↵ **ENTER** button again until PRINT DARKNESS shows on the screen.



6 Press the ▲/▼ buttons to select a value.

The setting range is from 1 to 10. 1 is the lightest and 10 is the darkest.

7 Press the ↵ **ENTER** button to save the setting.

8 Press the ⮌ **FUNCTION** button to return to the setting mode menu.

6.4.2 Adjusting the Print Speed

The adjustment of the print speed not only changes the speed of printing but also affects the print quality. The setting range of the print speed varies depending on the following print resolution:

Model	Print Resolution	Print Speed Setting Range
S84-ex	203 dpi (8 dots/mm)	4 to 16 (inches/sec)
S84-ex	305 dpi (12 dots/mm)	4 to 14 (inches/sec)
S84-ex	609 dpi (24 dots/mm)	2 to 6 (inches/sec)
S86-ex	203 dpi (8 dots/mm)	4 to 14 (inches/sec)
S86-ex	305 dpi (12 dots/mm)	4 to 12 (inches/sec)

The adjustment procedure for the print speed is as follows:

1 When the printer is in online mode, press the ⏯ **LINE** button to change the printer to offline mode.

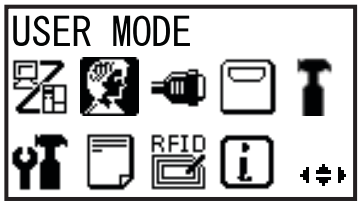
2 Press the ↵ **ENTER** button.

The printer changes to setting mode menu.



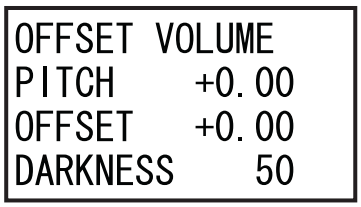
3 Select the **USER MODE** using the ▲/▼/◀/▶ buttons.

USER MODE shows on the screen and the icon is highlighted in reverse.



4 Press the ↵ **ENTER** button to enter the user mode.

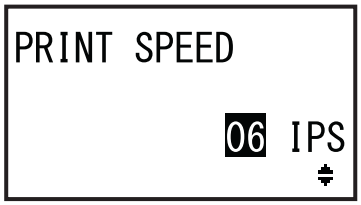
OFFSET VOLUME shows on the screen.



Note

If password function is enabled, PASSWORD is shown on the screen instead. In this case, enter the password first.

5 Press the ↵ **ENTER** button again until PRINT SPEED shows on the screen.



6 Press the ▲/▼ buttons to select a value.

7 Press the ↵ **ENTER** button to save the setting.

8 Press the ⮌ **FUNCTION** button to return to the setting mode menu.

6.5 Adjusting the Media Sensors

You can check the media sensor condition and adjust the media sensor level for optimum performance.

6.5.1 Adjusting the Media Sensor Automatically

The automatic adjustment procedure for the media sensor is as follows:

1 When the printer is in online mode, press the ⏯ **LINE** button to change the printer to offline mode.

2 Press the ↵ **ENTER** button.

The printer changes to setting mode menu.



3 Select the **SERVICE MODE** using the ▲/▼/◀/▶ buttons and then press the ↵ **ENTER** button.

SERVICE MODE setting screen shows.



Note

If password function is enabled, PASSWORD is shown on the screen instead. Enter the password to continue.

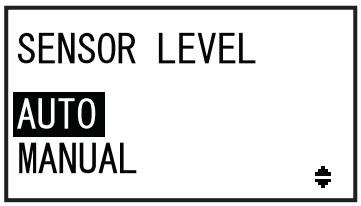
4 Select the **SENSOR LEVEL** using the ▲/▼ buttons and then press the ↵ **ENTER** button.

SENSOR LEVEL shows on the screen.



5 Select **AUTO** using the ▲/▼ buttons and then press the ↵ **ENTER** button.

SENSOR SELECT shows on the screen.



6 Press the ▲/▼ buttons to select the type of sensor to be adjusted and then press the ↵ **ENTER** button.



The instruction of placing the media shows.

When I-MARK is selected



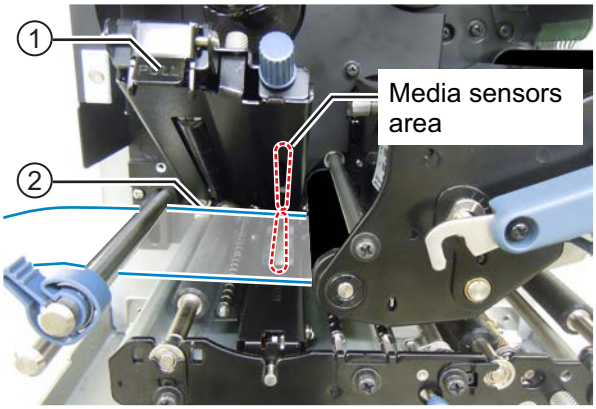
When GAP is selected



7 Open the **top cover** and unlock the **media feed** and **media sensor assembly** ①.

8 Place the **media/liner** ② on the media sensor.

To adjust the **I-mark sensor**, place the white area of media under the media sensor.
To adjust the **gap sensor**, peel off the label and place the liner under the media sensor.



9 Press the **media feed** and **media sensor assembly** ① down to lock it.

To get the correct adjustment result, perform the adjustment after you have closed the **media sensor assembly**.

10 Press the ↵ **ENTER** button to start the sensor adjustment.

11 The sensor adjustment result shows.

CALIBRATION COMPLETE shows when the automatic adjustment has succeeded.
CALIBRATION FAILED shows when the automatic adjustment has failed.

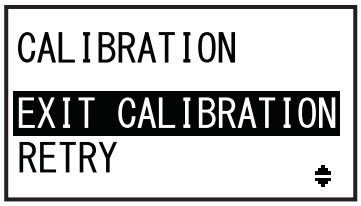


12 Press the ↵ **ENTER** button to proceed to next screen.



13 Press the ▲/▼ buttons to select the following function and then press the ↵ **ENTER** button.

- **EXIT CALIBRATION**: Exit the automatic sensor adjustment mode.
  Select **EXIT CALIBRATION** if COMPLETE is shown in step 11. The printer returns to SERVICE MODE setting screen.
- **RETRY**: Retry the automatic sensor adjustment.
  Select **RETRY** if FAILED is shown in step 11. The printer goes to SENSOR SELECT screen and repeat steps 6 through 12.



Note

If CALIBRATION FAILED shows in step 11, clean the media sensor and repeat the above steps for auto adjustment. Select RETRY in step 13. If the problem persists, adjust the media sensor sensitivity level manually. Refer to the following procedures for manual adjustment.

6.5.2 Adjusting the I-mark Sensor Level Manually

The adjustment procedure for the I-mark sensor level is as follows:

1 Go to the SENSOR LEVEL setting screen of SERVICE MODE.

Perform steps 1 through 4 of **Section 6.5.1 Adjusting the Media Sensor Automatically**.

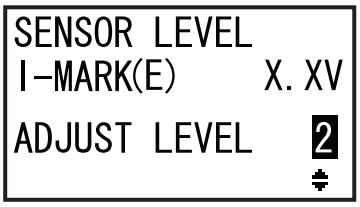
2 Select **MANUAL** using the ▲/▼ buttons and then press the ↵ **ENTER** button.

The light emission level adjustment of the I-mark sensor is shown.



3 On the SENSOR LEVEL I-MARK(E) screen, press the ▲/▼ buttons to set ADJUST LEVEL to 2 and then press the ↵ **ENTER** button.

The adjustment range of ADJUST LEVEL is from 0 to 3.
We recommend using the initial value which is 2.
The light reception level adjustment of the I-mark sensor is shown.



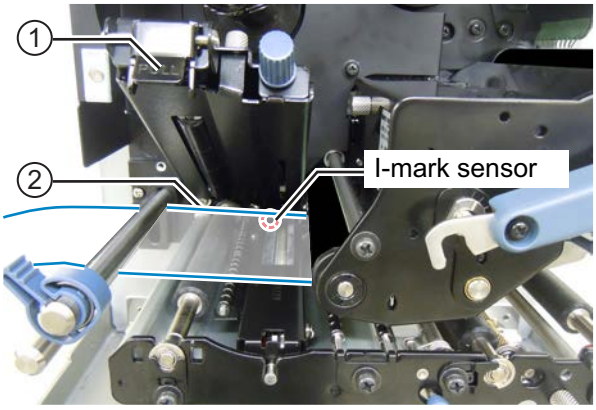
First, adjust the "Low" reception level (voltage) of the I-mark sensor.

4 Open the **top cover** and unlock the **media feed** and **media sensor assembly** ①.

5 Physically place the media ②, with the portion without the I-mark resting over the I-mark sensor.

6 Press the **media feed** and **media sensor assembly** ① down to lock it.

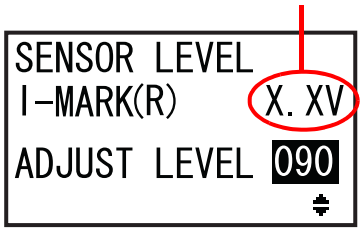
To get the correct adjustment result, close the **media sensor assembly** before performing the adjustment.



7 Press the ▲/▼ buttons to change ADJUST LEVEL until the I-MARK(R) value is 1.0 V or lower.

The adjustment range of ADJUST LEVEL is from 0 to 127.

Low level: ≤ +1.0V



Note

The ADJUST LEVEL manipulates the potentiometer which will be, therefore, reset to 90, the default value when replacing the PCB or initializing the settings.

8 Take a note of the I-MARK(R) value from the above procedure. This is the “Low” level value for the I-mark sensor.

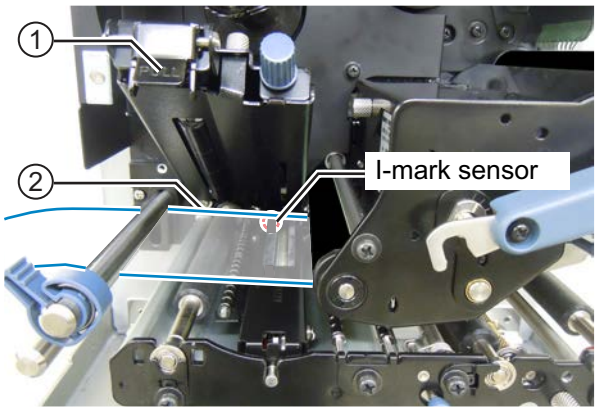
Next, check the “High” level (voltage) of the I-mark sensor.

9 Unlock the **media feed** and **media sensor assembly** ①.

10 Physically place the I-mark media ② again, so that the media sensor can sense the I-mark.

11 Press the **media feed** and **media sensor assembly** ① down to lock it.

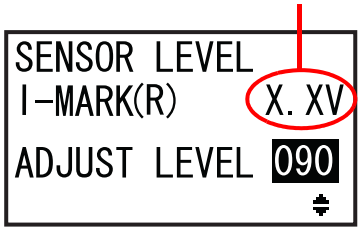
To get the correct adjustment result, close the **media sensor assembly** before performing the adjustment.



12 Check the new I-MARK(R) value. This is the “High” level value for the I-mark sensor.

If the difference between the “High” and the “Low” level values is 1.0 V or more, then the adjustment has satisfied the criteria.
If the difference between the “High” and the “Low” level values is less than 1.0 V, repeat the procedure from steps 4 through 12.

High level



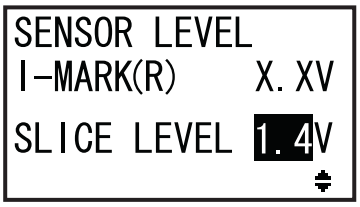
Criteria for Adjustment:	
Low level (portion without I-mark):	≤ +1.0 V
High level (I-mark position) - Low level:	≥ +1.0 V

13 Press the ↵ **ENTER** button to confirm the setting and proceed to slice level adjustment screen.

Note

If you are having difficulties in adjusting the sensor level properly, clean the media sensor portion. If the problem persists, contact your SATO reseller or technical support center to replace the media sensor.

14 Press the ▲/▼ buttons to change the SLICE LEVEL and then press the ↵ **ENTER** button.



The slice level can be set to 0.0 V, or from 0.3 V to 2.9 V. (adjustable in increments of 0.1 V)
If you set the SLICE LEVEL to 0.0 V, the printer sets the slice level automatically.

15 If you completed with I-mark sensor level adjustment, press the ⮌ **FUNCTION** button to return to the SERVICE MODE menu. Otherwise, continue with the Gap sensor level adjustment.

Proceed to step 2 of **Section 6.5.3 Adjusting the Gap Sensor Level Manually**.

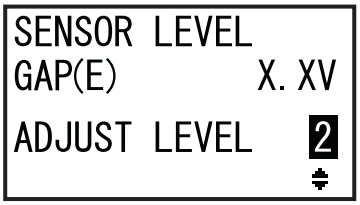
6.5.3 Adjusting the Gap Sensor Level Manually

The adjustment procedure for the Gap sensor level is as follows:

1 Continue the procedure from step 15 of **Section 6.5.2 Adjusting the I-mark Sensor Level Manually**.

If you only want to adjust the Gap sensor level, after selecting MANUAL in SENSOR LEVEL screen, press ↵ **ENTER** button repeatedly until SENSOR LEVEL GAP(E) screen is shown.

2 On the SENSOR LEVEL GAP(E) screen, press the ▲/▼ buttons to set ADJUST LEVEL to 2 and then press the ↵ **ENTER** button.



The adjustment range of ADJUST LEVEL is from 0 to 3.
We recommend using the initial value which is 2.
The light reception level adjustment of the Gap sensor is shown.

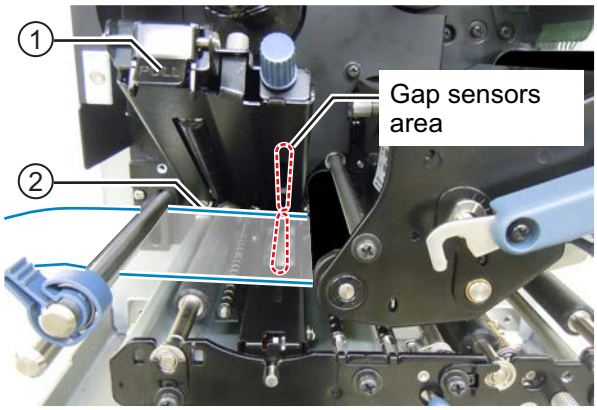
First, adjust the "Low" reception level (voltage) of the Gap sensor.

3 Open the **top cover** and unlock the **media feed** and **media sensor assembly** ①.

4 Physically place the liner ② without the label resting over the Gap sensor.

5 Press the **media feed** and **media sensor assembly** ① down to lock it.

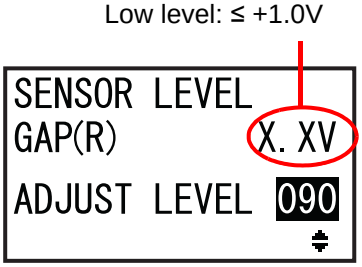
To get the correct adjustment result, close the **media sensor assembly** before performing the adjustment.



6 Press the ▲/▼ buttons to change ADJUST LEVEL until the GAP(R) value is 1.0 V or lower.

The adjustment range of ADJUST LEVEL is from 0 to 127.

Low level: ≤ +1.0V



Note

The ADJUST LEVEL manipulates the potentiometer which will be, therefore, reset to 90, the default value when replacing the PCB or initializing the settings.

7 Take a note of the GAP(R) value from the above procedure. This is the “Low” level value for the Gap sensor.

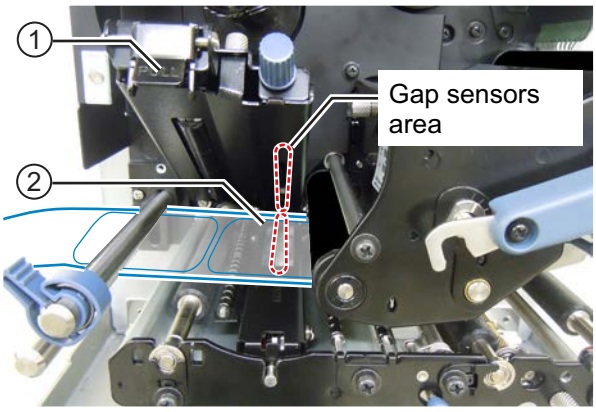
Next, check the “High” level (voltage) of the Gap sensor.

8 Unlock the **media feed** and **media sensor assembly** ①.

9 Physically place the label ② resting over the Gap sensor.

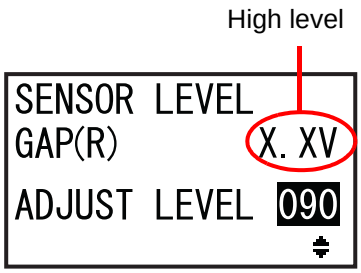
10 Press the **media feed** and **media sensor assembly** ① down to lock it.

To get the correct adjustment result, close the **media sensor assembly** before performing the adjustment.



11 Check the new GAP(R) value. This is the “High” level value for the Gap sensor.

If the difference between the “High” and the “Low” level values is 1.0 V or more, then the adjustment has satisfied the criteria.
If the difference between the “High” and the “Low” level values is less than 1.0 V, repeat the procedure from steps 3 through 11.



Criteria for Adjustment:	
Low level (liner portion):	≤ +1.0 V
High level (label portion) - Low level:	≥ +1.0 V

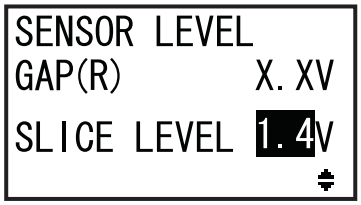
12 Press the ↵ **ENTER** button to confirm the setting and proceed to slice level adjustment screen.

Note

If you are having difficulties in adjusting the sensor level properly, clean the media sensor portion. If the problem persists, contact your SATO reseller or technical support center to replace the media sensor.

13 Press the ▲/▼ buttons to change the SLICE LEVEL and then press the ↵ **ENTER** button.

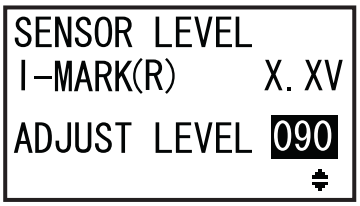
The slice level can be set to 0.0 V, or from 0.3 V to 2.9 V. (adjustable in increments of 0.1 V)
If you set the SLICE LEVEL to 0.0 V, the printer sets the slice level automatically.



6.5.4 Adjusting the Paper End Sensor

This printer uses an I-mark sensor to sense the Paper end error.
The checking and adjustment procedures for the Paper end (I-mark) sensor level are as follows:

1 Go to the SENSOR LEVEL I-MARK(R) setting screen of SERVICE MODE.



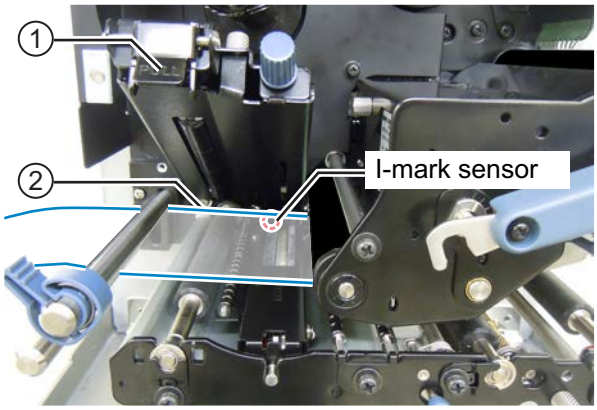
First, check the I-MARK(R) value (voltage) of the Paper end (I-mark) sensor when the liner is placed on the sensor.

2 Open the **top cover** and unlock the **media feed** and **media sensor assembly** ①.

3 Physically place the liner ② without the label resting over the I-mark sensor.

4 Press the **media feed** and **media sensor assembly** ① down to lock it.

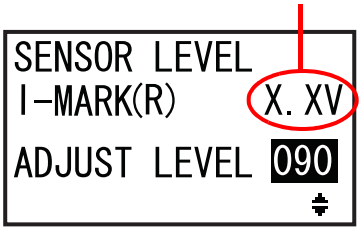
To get the correct adjustment result, close the **media sensor assembly** before performing the adjustment.



5 Check if the I-MARK(R) value is 2.0 V or lower.

If not, change ADJUST LEVEL using the ▲/▼ buttons until the I-MARK(R) value is 2.0 V or lower.

I-MARK(R) level: ≤ +2.0V



Next, check the I-MARK(R) value (voltage) of the Paper end (I-mark) sensor when no media is placed on the sensor.

6 Unlock the **media feed** and **media sensor assembly** ①.

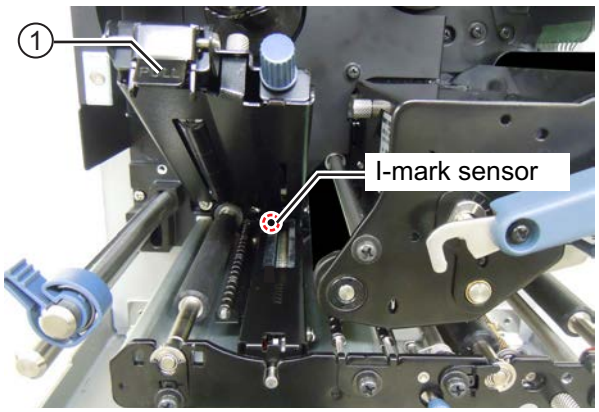
7 Remove all the media from the media sensor.

8 Press the **media feed** and **media sensor assembly** ① down to lock it.

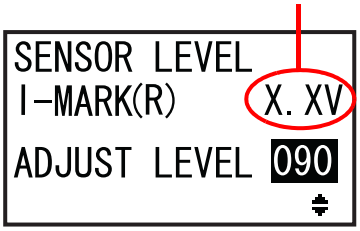
To get the correct adjustment result, close the **media sensor assembly** before performing the adjustment.

9 Check if the new I-MARK(R) value is 2.2 V or higher.

If not, change ADJUST LEVEL using the ▲/▼ buttons until the I-MARK(R) value is 2.2 V or higher.



I-MARK(R) level ≥ +2.2V



Criteria for Adjustment:	
I-MARK(R) value (liner without label):	≤ +2.0 V
I-MARK(R) value (without any media):	≥ +2.2 V

10 Press the ↵ **ENTER** button to confirm the setting.

11 Press the ⮌ **FUNCTION** button to return to the SERVICE MODE menu.

6.6 Adjusting the Head Pressure Balance

Print head balance refers to the equalization of pressure between the print head and the platen roller. If the print head balance is out of adjustment, the printed image will be darker on one side of the media than the other and the media will be prone to travel in the direction of greater pressure.

Setting the Criteria of the Head Pressure Balance

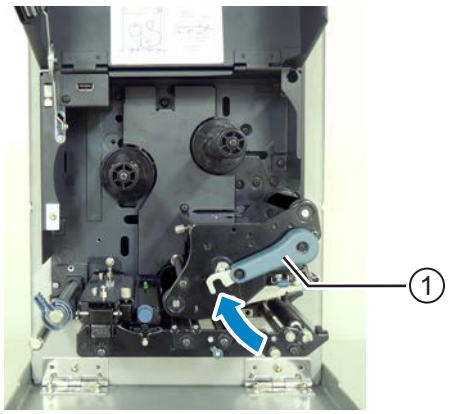
- Set the pressure balance according to the media width.
- Set the head pressure according to the media thickness, including the liner.

Required tool:
Slotted screw driver

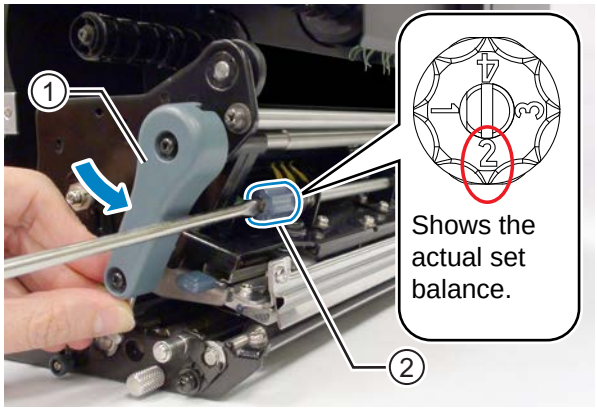
The adjustment procedure for the pressure balance is as follows:

1 Open the **top cover** of the printer.

2 Turn the **head lock lever** ① clockwise to unlock the print head.



3 Then, turn the **head lock lever** ① back before it locks. You can find the **adjustment dial** ② beside the **head lock lever** as shown.



4 Use the slotted screw driver to turn the **adjustment dial** ②. Set the pressure balance according to the media width and media thickness.

Media Thickness		0.05 to 0.20 mm (0.002” to 0.0079”) Thin paper/normal label, etc.		0.20 to 0.31 mm (0.0079” to 0.30122”) Thick paper/tag, etc.	
Media Width	**S84-ex**	30 to 128 mm (1.18” to 5.04”)	10 to <30 mm (0.39” to <1.18”)	30 to 128 mm (1.18” to 5.04”)	10 to <30 mm (0.39” to <1.18”)
	S86-ex	80 to 177 mm (3.15” to 6.97”)	51 to <80 mm (2.01” to <3.15”)	80 to 177 mm (3.15” to 6.97”)	51 to <80 mm (2.01” to <3.15”)
Pressure Balance Adjustment Dial		❶	❸	❷	❹

Note

- The factory default setting is ❷.
- The thickness of the media includes the liner.

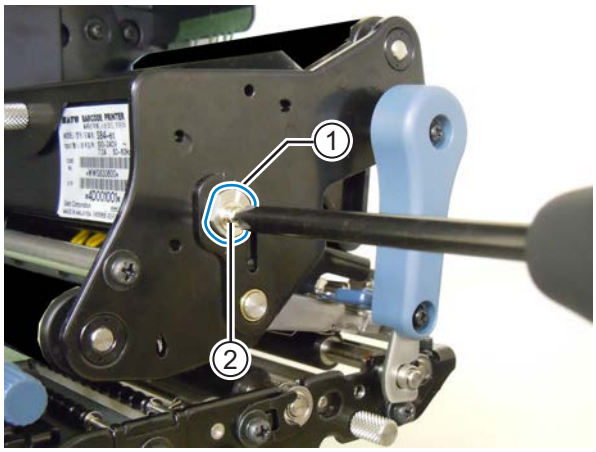
6.7 Adjusting the Head Position

6.7.1 Left - Right Pressure Balance Setting

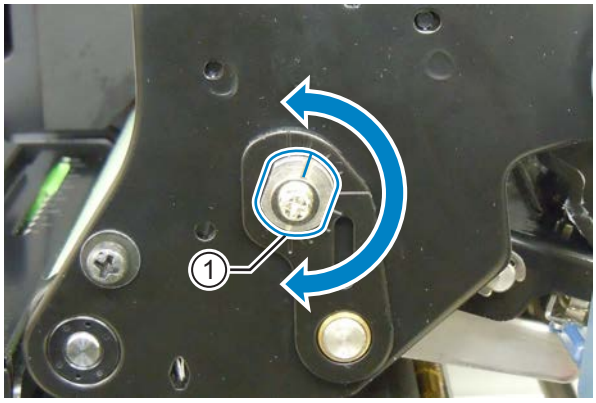
Required tool:
Phillips screwdriver

The adjustment procedure for the pressure balance is as follows:

1. Open the **top cover** of the printer.
2. Make sure that the **head lock lever** is in the lock position.
   If it is not locked, turn the **head lock lever** counterclockwise to lock the print head.
3. Locate the **adjust collar** ① on the side of the **print head assembly**.
4. Loosen the **screw** ② attached to the **adjust collar** ①.
   Do not remove the screw.



5. Rotate the **adjust collar** ① to adjust the head pressure balance.
   - Rotate the **adjust collar** counterclockwise to increase the head pressure on the frame side.
   - Rotate the **adjust collar** clockwise to increase the head pressure on the opposite side.



Note
If the printer orientation is opposite from the photo, the adjustment direction is reversed.

6. Hold the **adjust collar** ① in the set position and tighten the **screw** ②.

6.7.2 Front - Rear Head Alignment

Required tools:
- Phillips screwdriver
- Slotted screwdriver

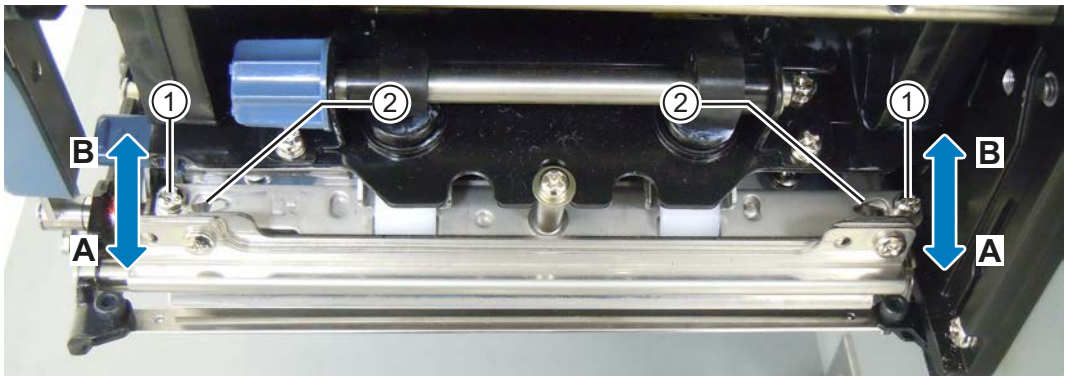
The adjustment procedure for the head alignment is as follows:

1 Open the **top cover** of the printer.

2 Make sure that the **head lock lever** is in the lock position.

If it is not locked, turn the **head lock lever** counterclockwise to lock the print head.

3 Locate two **screws** ① from the front of the **print head assembly**.



4 Loosen two **screws** ① using the Phillips screwdriver.

Do not remove the screws.

5 Insert the slotted screwdriver into the **regulation apertures** ② on the left and right sides. Adjust the head position by turning the slotted screwdriver in the relevant direction.

- Direction A: Print head position moves forward.
- Direction B: Print head position moves backward.

6 Tighten two **screws** ①.

6.8 Adjusting the Ribbon Tension Balance

If the ribbon is not spread smoothly over the print head, print voids will occur at the point of the ribbon fold. Typically, this is the result of the axis of the ribbon spindle, print head and the ribbon adjustment plate not being perfectly parallel.

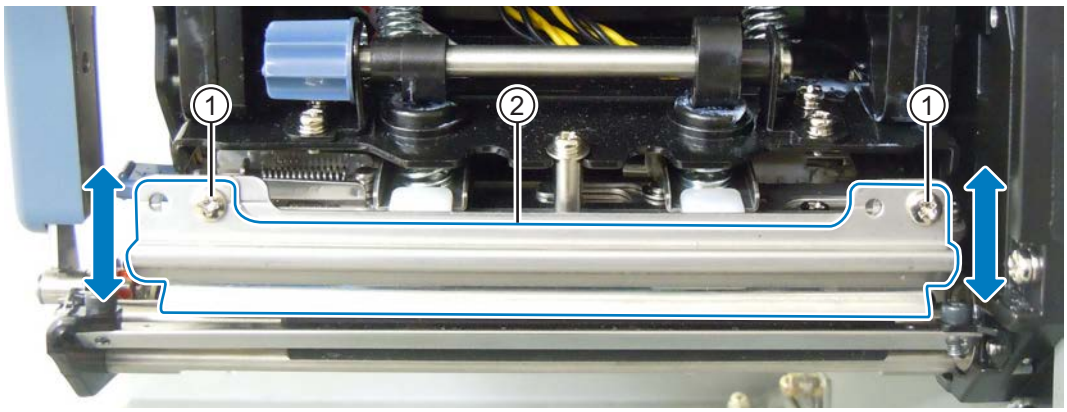
Required tool:
Phillips screwdriver

The adjustment procedure for the ribbon tension is as follows:

1 Open the **top cover** of the printer.

2 Turn the **head lock lever** clockwise to unlock the print head.

3 Locate two **screws** ① from the front of the **print head assembly**.



4 Loosen two **screws** ① attached to the **ribbon adjustment plate** ②.

Do not remove the screws.

5 Adjust the **ribbon adjustment plate** ② as shown below.

- Adjust the left side of the plate upward when a wrinkle occurs on the right.
- Adjust the right side of the plate upward when a wrinkle occurs on the left.

6 Hold the **ribbon adjustment plate** ② in the set position and tighten two **screws** ①.

7 Perform a test print to check the printing quality.

The ribbon must not be wrinkled or meander.

8 Repeat the procedure from steps 1 through 6 until the ribbon tension is even on both sides.

6.9 Adjusting the Media Feed Roller Balance

If the media is inclined to meander at the media feed-in to one side, media feed roller balance adjustment may be required.

This media feed roller is spring loaded on each end and embedded in the media sensor assembly. By adjusting the screw on either end downward, the pressure on that end is increased. Likewise, an adjustment of the screw upward on either end, reduces pressure on that side.

Before adjusting the media feed roller, ensure the print head is properly positioned and balanced.

Required tools:
Phillips screwdriver
Long-nose pliers or wrench

The adjustment procedure for the media feed roller balance is as follows:

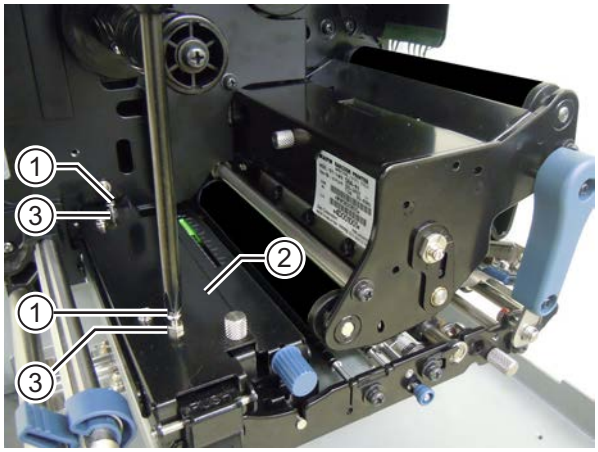
1 Open the **top cover** of the printer.

2 Locate two **screws** ① on the top of the **feed roller and media sensor assembly** ②.

3 Loosen the **locknut** ③ underneath the **screw** ① on either side.

4 Adjust the relative **screw** ① to increase or decrease the pressure.

- Tighten the screw to increase the roller pressure.
- Loosen the screw to decrease the roller pressure.



5 Perform media feed to check the flow of the media.

The media must not meander.

6 Adjust the same **screw** ① in step 4 again until the media feed without meandering.

7 When the desired outcome is achieved, hold the adjusted **screw** ① in position while tightening the relative **locknut** ③.

7 Troubleshooting

This chapter explains the errors that can occur on the printer and the displays for indicating the current status.

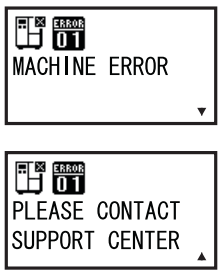
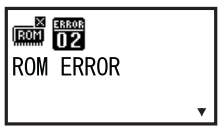
7.1 When an Error Message Occurs

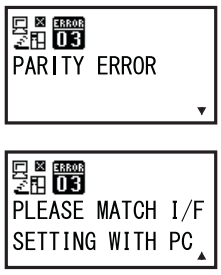
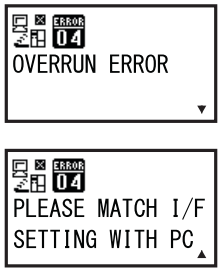
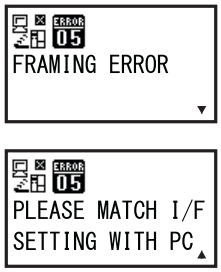
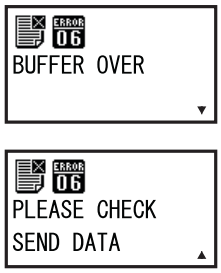
When there is an error on the printer, the error message will show on the screen.
The error message and the countermeasure message alternate every three seconds.
These screens can be switched using the ▲/▼ buttons.

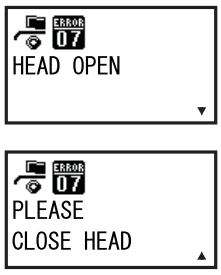
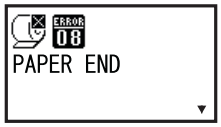
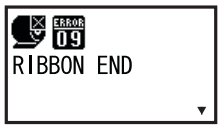
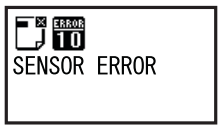
⚠ CAUTION

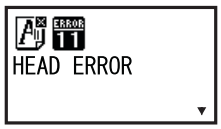
Where parts replacement is concerned, contact your SATO reseller or technical support center to perform internal inspections and repairs.

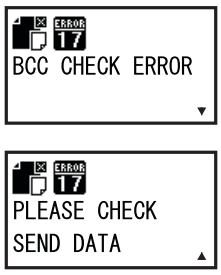
The error message, its cause and the countermeasures are as follows.

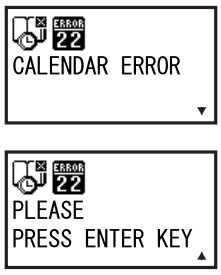
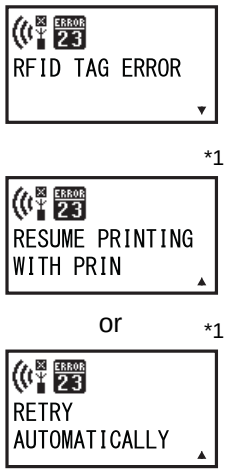
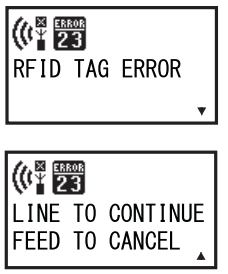
Error				
No.	**Message**	**LED/Buzzer**	**Cause**	**Countermeasure**
01	Machine error  	Lights red. One long beep. To clear the error: Power off the printer.	Defective circuit board.	Replace the main (CONT) PCB.
02	Flash ROM error  	Lights red. One long beep. To clear the error: Power off the printer.	Flash ROM is not accessible. Number of write has been exceeded.	Replace the main (CONT) PCB.

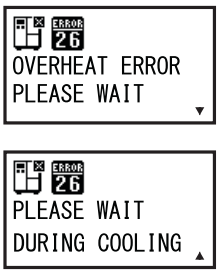
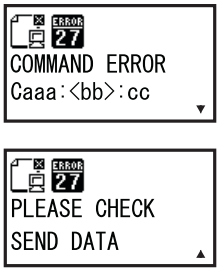
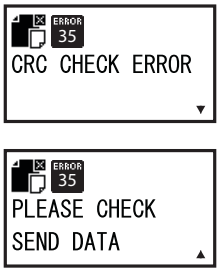
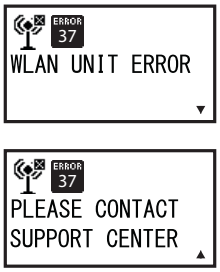
Error				
No.	**Message**	**LED/Buzzer**	**Cause**	**Countermeasure**
03	Parity error 	Flashes blue and red alternately. Three short beeps. To clear the error: Power off the printer.	RS-232C settings are incorrect.	Adjust the interface settings correctly.
			The cable connection is incorrect.	Check and connect the cable correctly.
04	Overrun error 	Flashes blue and red alternately. Three short beeps. To clear the error: Power off the printer.	RS-232C settings are incorrect.	Adjust the interface settings correctly.
			The cable connection is incorrect.	Check and connect the cable correctly.
05	Framing error 	Flashes blue and red alternately. Three short beeps. To clear the error: Power off the printer.	RS-232C settings are incorrect.	Adjust the interface settings correctly.
			The cable connection is incorrect.	Check and connect the cable correctly.
06	Buffer overflow 	Flashes blue and red alternately. Three short beeps. To clear the error: Power off the printer.	The size of the received data exceeds the size of the receive buffer.	Do not send data that exceeds the size of the receive buffer.
			The communication settings between the printer and the host are incorrect.	Set the communication between the printer and the host correctly.

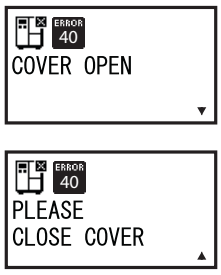
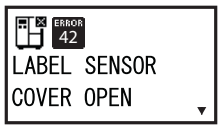
Error				
No.	**Message**	**LED/Buzzer**	**Cause**	**Countermeasure**
07	Head open  	Flashes red. Three short beeps. To clear the error: Close the print head.	The print head is unlocked.	Lock the print head.
			The sensor for sensing the open/close status of the print head is defective.	Replace the sensor for sensing the open/close status of the print head.
08	Paper end  	Flashes red. Three short beeps. To clear the error: Open and close the print head.	The media is not loaded.	Load the media correctly.
			The media is not loaded correctly.	
			The sensitivity of the media sensor is not set correctly.	Adjust the sensor level.
			The media has jammed.	Remove the jammed media.
			The media sensor is dirty.	Clean the media sensor.
			The cable of the media sensor is disconnected.	Connect the cable of the media sensor correctly.
09	Ribbon end  	Flashes red. Three short beeps. To clear the error: Open and close the print head.	The ribbon is not loaded.	Load a new ribbon.
			The ribbon is damaged.	
			The ribbon is not loaded correctly.	Load the ribbon correctly.
			The ribbon is torn.	Clean and adjust the ribbon path.
10	Sensor error 	Lights red. Three short beeps. To clear the error: Open and close the print head.	The media sensor level is incorrect.	Adjust the media sensor level.
			The sensor type is incorrect.	Use the correct sensor type.
			Meandering media.	Clean and adjust the media path.

Error				
No.	**Message**	**LED/Buzzer**	**Cause**	**Countermeasure**
11	Print head error  	Lights red. One long beep. To clear the error: Power off or change the head check conditions.	The print elements are worn out.	Change print head check conditions to only check for missing elements in barcodes and try to adjust missing elements to white bars. Refer to **Section 7.1.2 More Information about Head Check Function** for details.
			The print head is damaged.	Replace the print head. Refer to **Section 8.7.1 Replacing the Print Head** for details.
12	Memory write error  Printer memory:  USB memory: 	Flashes red. One long beep. To clear the error: Power off the printer.	The USB memory is disconnected while writing.	Connect the USB memory.
			The copy area in the memory is not sufficient.	Make sure that the memory has sufficient copy area.
			Writing to the memory fails.	Replace the memory.
			The USB memory is not formatted.	Format the USB memory in the memory mode. Refer to **Section 4.2.11 Memory Mode** for details.
	SD card write error  	Flashes red. One long beep. To clear the error: Power off the printer.	The SD card is not connected.	Connect the SD card.
			The SD card is not connected correctly.	Connect the SD card correctly.
			The SD card is disconnected while writing.	Connect the SD card.
			The SD card read/write fails.	Replace the SD card.
			The SD card is not formatted.	Format the SD card in the memory mode. Refer to **Section 4.2.11 Memory Mode** for details.
			The SD card is write-protected.	Release the write-protect of the SD card.

Error				
No.	**Message**	**LED/Buzzer**	**Cause**	**Countermeasure**
13	Memory full error 	Flashes red. One long beep. To clear the error: Power off the printer.	The space in the memory is not sufficient.	Delete unwanted data from the memory.
14	Download data error 	Lights red. One long beep.	The downloaded data is incorrect.	Check the downloaded data.
			The download area is not sufficient.	Check the downloaded data size.
17	BCC check error 	Flashes red. Three short beeps. To clear the error: Press the ⏵‖ **LINE** button or cancel the print job.	The BCC code of the data to be sent (one item) is incorrect.	Check the data to be sent and the communication settings. ⏵‖ **LINE** button: Continue printing from the print data where the BCC error occurred. Send the SUB command: Clear the BCC error and continue printing from where it stopped.
18	Item No. error 	Flashes red. Three short beeps. To clear the error: Press the ⏵‖ **LINE** button or cancel the print job.	Sequence number of print data (one item) is not increased by one. *The sequence number is not in sequential order.	Check the data to be sent and the communication settings. ⏵‖ **LINE** button: Continue printing from the print data where the Item No. error occurred. Send the SUB command: Clear the Item No. error and continue printing from where it stopped.

Error				
No.	**Message**	**LED/Buzzer**	**Cause**	**Countermeasure**
22	Calendar error 	Lights red. One long beep. To clear the error: Power off the printer.	The date and time of the calendar are incorrect or the calendar IC is not installed.	Check if you have installed the calendar IC or replace the calendar PCB.
23	RFID tag error 	Flashes red. Three short beeps. To clear the error: Auto recovery or cancel the job. (Press the ✕ **CANCEL** button or send the CAN command.) *1 The second screen will be switched by EXT signal setting.	Could not read/write to the RFID inlay.	Discard this tag.
23	RFID tag error 	Flashes red. Three short beeps. To clear the error: Press the ⏯ **LINE** or **FEED** button. Press the ✕ **CANCEL** button or send the CAN command to cancel the job.	The number of failed RFID writes exceeded the specified MAX ERR COUNT.	Discard this tag.

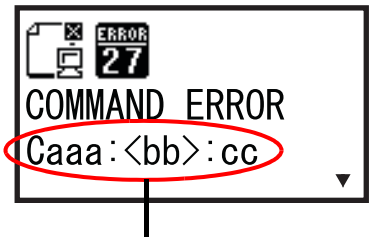
Error				
No.	**Message**	**LED/Buzzer**	**Cause**	**Countermeasure**
26	Overheat error 	Flashes blue and red alternately. One long beep. To clear the error: Stop the operation of the printer and wait until the temperature decreases.	The temperature of the printer has exceeded its tolerance value.	Stop the operation of the printer to let the temperature decrease.
27	Command error 	Flashes red. Three short beeps. To clear the error: Press the ▶|| **LINE** button.	Incorrect command or parameter in the print data. Caaa: position of error occurrence <bb>: error command name cc: error code	Check the print data. Refer to **Section 7.1.1 More Information about Command Error** for details.
35	CRC check error 	Flashes red. Three short beeps. To clear the error: Press the ▶|| **LINE** button or cancel the print job.	The CRC code of the data to be sent (one item) is incorrect.	Check the data to be sent and the communication settings. ▶|| **LINE** button: Continue printing from the print data where the CRC error occurred. Send the SUB command: Clear the CRC error and continue printing from where it stopped.
37	Wireless LAN error 	Flashes blue and red alternately. Three short beeps. To clear the error: Power off the printer.	No wireless LAN unit is connected while the printer is in wireless LAN download mode.	Make sure that the wireless LAN unit is connected correctly.
			The printer failed to connect to the wireless LAN unit.	Change the wireless LAN unit. *When you change the wireless LAN, the data port and sub port in the communication settings change depending on the settings.

Error				
No.	**Message**	**LED/Buzzer**	**Cause**	**Countermeasure**
40	Cover open error  	Flashes red. Three short beeps. To clear the error: Close the cover.	The cover is opened. The sensor for sensing the open/close status of the cover is defective.	Close the cover. Replace the sensor for sensing the open/close status of the cover.
41	Saver error  	Lights red. One long beep. To clear the error: Power off the printer.	The print head cannot stop at the specified position.	Adjust the saver head position. Replace the saver sensor. Replace the saver motor and motor driver PCB. Replace the saver cam.
42	Sensor cover open error  	Flashes red. Three short beeps. To clear the error: Close the sensor cover.	The sensor cover is unlocked. The sensor for sensing the open/close status of the sensor cover is defective.	Lock the sensor cover. Replace the sensor for sensing the open/close status of the sensor cover.

7.1.1 More Information about Command Error

Printer motion when detecting a command error

When COMMAND ERROR is set to ENABLE in advanced mode, the command error information is shown on the error message (second line), and the print operation is paused.
This error can be cleared by pressing the ▶|| **LINE** button, but the data in which an error is detected is discarded and cannot be printed.



Command error information

Location of error occurrence

"Caaa" in the command error message shows the location of command error.
The number of ESC commands from ESC+A is shown in "aaa".
Note that the ESC+A command is not included in the number of ESC commands, which can be shown up to 999. If the number of ESC commands exceeds 999, it is shown as "999".

Example)
When a command error is detected by the Horizontal Print Position <H> command.

-------: [ESC]A
C001: [ESC]V100
C002: [ESC]H99999 => Location of the command error
C003: [ESC]L0202
C004: [ESC]M,ABCDEF
C005: [ESC]Q1
C006: [ESC]Z

In this case, C002 is the location of the error.

Error command name

The command name, in which an error is detected, is shown in "<bb>".
* A one-byte command name is left aligned.

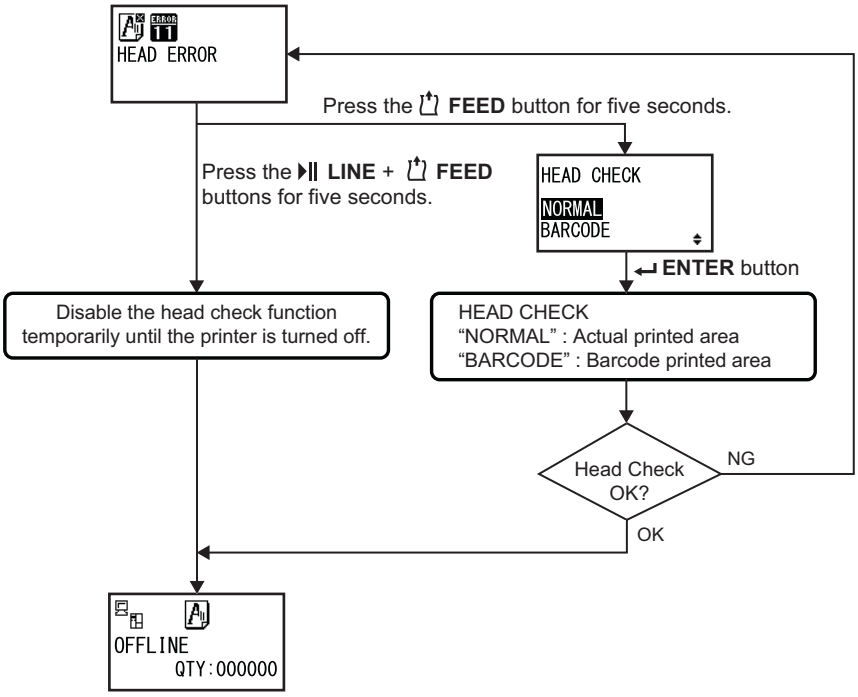
Error code

The cause of command error will be indicated in the code in "cc" where an error is being shown.

Code <cc>	Cause
01	Analyzed improper command.
02	Received improper parameter.
03	Analyzed improper graphic and external character data.
04	Specified memory area (card slot) is inappropriate. Tried to write to a write-protected media.
05	Number specified by registration command has already been taken.
06	Exceeded the registration area. (Memory full).
07	Data is not registered.
08	The specified print start position is outside the printable area.
09	The printing image is outside the printable area. (Barcode only).

7.1.2 More Information about Head Check Function

The head check function detects the integrity of the heating elements in the print head. However, malfunctions cannot be detected instantaneously — a few printed media may start showing printing defects before the printer warns of a print head error.
After detection of a print head error, use a scanner to check all affected media.



When a print head error occurs during normal printing (barcodes, text and graphics)

1 Press and hold down the **FEED** button for five seconds.

HEAD CHECK setting screen shows.

2 Select BARCODE using the ▲/▼ buttons and then press the **ENTER** button.

3 See if printing can be resumed normally.

If printing resumes, the print head fault does not fall on the barcode area for the current print job. As such, printing may be continued but with degraded print quality and readable barcodes.

If the head check error still occurs and the current print job has to be completed, printing can be forced to resume by holding down the **LINE** and **FEED** buttons for five seconds.

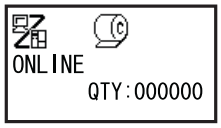
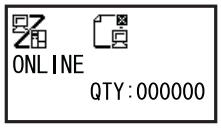
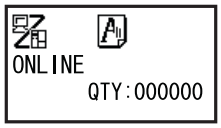
Read the caution note below before you proceed with this operation.

⚠ CAUTION

Although restricting the head check type to BARCODE allows you to continue printing, or forcing the printer to resume printing, you should only do so in order to complete an urgent print job. Check the printed media to make sure the output is usable in spite of the head error. As soon as possible, stop using the print head to prevent further damage. If necessary, replace the print head.

7.2 When a Warning Message Occurs

When a warning message is shown on the screen, the printer continues issuing media.
The warning message, its cause and the countermeasures are as follows:

Warning				
No.	**Message**	**LED/Buzzer**	**Cause**	**Countermeasure**
01	Label near end 	Lights blue. No beep. To clear the error: Open and close the print head.	The remaining amount of media is not enough.	Replace the media. Refer to **Section 3.5 Loading Media** for details.
02	Ribbon near end 	Lights blue. No beep. To clear the error: Open and close the print head.	The remaining amount of ribbon is not enough.	Replace the ribbon. Refer to **Section 3.2 Loading the Ribbon** for details.
03	Receive buffer nearly full 	Lights blue. No beep.	Available space for receive buffer is low.	Do not send data from the host until the analysis of received data is completed.
04	Command error 	Lights blue. One short beep. To clear the error: The icon will be cleared by receiving the next item or canceling the job.	Command error has been detected.	Check the print data.
05	Head error 	Lights blue. No beep.	A head check error is detected when “NORMAL” has been selected for the HEAD CHECK setting screen. Change the HEAD CHECK setting to “BARCODE” and continue the print job.	Replace the print head. Refer to **Section 8.7.1 Replacing the Print Head** for details.

Warning				
No.	**Message**	**LED/Buzzer**	**Cause**	**Countermeasure**
06	Clean print head and platen roller 	Lights blue. One short beep. To clear the error: Press the ↵ **ENTER** button.	The set notification interval has been reached.	Clean the print head and platen roller. Refer to **Section 6.2 Maintenance of the Print Head and Platen Roller** for details.
07	Change print head 	Lights blue. One short beep. To clear the error: Press the ↵ **ENTER** button.	The set notification interval has been reached.	Replace the print head. Refer to **Section 8.7.1 Replacing the Print Head** for details.
08	Change platen roller 	Lights blue. One short beep. To clear the error: Press the ↵ **ENTER** button.	The set notification interval has been reached.	Replace the platen roller. Refer to **Section 8.7.2 Replacing the Platen Roller** for details.

7.3 When the LED Lights Red/Blue

The LED will light or flash to show the current status of the printer.
The status when the LED lights or flashes is as follows:

LED	Printer Status	Countermeasure
Light off.	The power is off or the printer is in offline mode.	Power on the printer or change it to online mode.
Lights blue.	The printer is in online mode.	You can operate the printer.
Lights red/ Flashes red/ Flashes blue and red alternately.	An error has occurred.	Clear the error according to the message.

7.4 Troubleshooting Table

Check the items below when the printer does not operate correctly.

⚠ WARNING

- Do not touch the power switch, connect or disconnect the power cord while your hands are wet. Doing so could cause an electric shock.
- Disconnect the power cord from the AC outlet before you perform the cleaning.

Note

You can purchase a cleaning kit or cleaning sheet from a SATO reseller or technical service center.

7.4.1 No Power/Nothing on the Screen

No.	What to check	Countermeasure
1	Is the power cord fully connected to the AC outlet?	Connect the power cord to the AC outlet fully.
2	Is the power cord fully connected to the printer?	Connect the power cord to the AC input terminal of the printer fully.
3	Is the printer fuse blown?	Replace the printer fuse. Contact a SATO reseller or technical service center for replacement.
4	Is the power cord damaged?	Replace the power cord. Contact a SATO reseller or technical service center for the specific power cord for this printer. Do not use power cords that are not designed specifically for this printer.
5	Is there electricity at the AC outlet that supplies the power to the printer?	Check if there is electricity at the AC outlet. Connect to another AC outlet.
6	Is the main (CONT) PCB defective?	Replace the main (CONT) PCB. Contact a SATO reseller or technical service center for replacement.

7.4.2 Cannot Feed the Media

No.	What to check	Countermeasure
1	Are the media and ribbon designed for the printer?	Use media and ribbon designed for the printer.
2	Are the media and ribbon loaded correctly?	Load the media and ribbon correctly.

No.	What to check	Countermeasure
3	Is the media or ribbon deformed?	Use the media or ribbon that is not deformed. You cannot feed the media or ribbon that is deformed.
4	Is the media guide set correctly?	Adjust the media guide.
5	Is the correct sensor type set?	Set the correct sensor type.
6	Is the sensitivity of the sensor set correctly?	Adjust the sensor level.
7	Is the platen roller dirty?	If the platen roller is dirty, clean it with the cleaning kit. For printer cleaning, refer to **Section 6.2 Maintenance of the Print Head and Platen Roller**.
8	Is the platen roller damaged?	Replace the platen roller.
9	Does the interface operate correctly?	Check the interface according to the **Interface Troubleshooting**.
10	Is the data or signal sent from the computer incorrect?	Power on the device again. Check the data sent from the computer and communication conditions.
11	Is the main (CONT) PCB defective?	Replace the main (CONT) PCB. Contact a SATO reseller or technical service center for replacement.

7.4.3 Can Feed the Media but Cannot Print

No.	What to check	Countermeasure
1	Are the media and ribbon designed for use with the printer?	Use the media and ribbon designed for the printer.
2	Is the correct sensor type set?	Set a correct sensor type.
3	Is the print head installed correctly?	Install the print head correctly.
4	Is the pressure of the print head too strong or too weak?	Adjust the pressure of the print head with the head pressure adjustment dial.
5	Is the print head dirty or is there a label attached to it?	If the print head is dirty, clean it using the cleaning pen. If a label is attached to the print head, remove it. If the glue of label is attached to the print head, clean it using a cleaning kit. Do not clean using a hard object. Doing so could cause damage to the print head. For printer cleaning, refer to **Section 6.2 Maintenance of the Print Head and Platen Roller**.

No.	What to check	Countermeasure
6	Is the media sensor dirty?	If the media sensor is dirty, clean it using the cleaning kit. For printer cleaning, refer to **Section 6.2 Maintenance of the Print Head and Platen Roller**.
7	Does the interface operate correctly?	Check the interface according to the **Interface Troubleshooting**.
8	Is the data or signal sent from the computer incorrect?	Power on the device again. Check the data sent from the computer and communication conditions.
9	Is the print head defective?	Replace the print head and reset the counter.
10	Is the main (CONT) PCB defective?	Replace the main (CONT) PCB. Contact a SATO reseller or technical service center for replacement.

7.4.4 Bad Print Quality

No.	What to check	Countermeasure
1	Are the media and ribbon designed for use with the printer?	Use media and ribbon designed for the printer.
2	Are the media and ribbon loaded correctly?	Check if the media and ribbon are loaded correctly.
3	Is the tension of the ribbon correct?	Adjust the tension of the ribbon.
4	Is the print head installed correctly?	Install the print head correctly.
5	Is the pressure of the print head too strong or too weak?	Adjust the pressure of the print head with the head pressure adjustment dial.
6	Is the print speed too fast?	Adjust the print speed.
7	Is the print darkness too low or too high?	Adjust the print darkness.
8	Is the platen roller dirty?	If the platen roller is dirty, clean it using the cleaning kit. For printer cleaning, refer to **Section 6.2 Maintenance of the Print Head and Platen Roller**.
9	Is the print head dirty or is there a label attached to it?	If the print head is dirty, clean it using the cleaning pen. If a label is attached to the print head, remove it. If the glue of label is attached to the print head, clean it using a cleaning kit. Do not clean using a hard object. Doing so could cause damage to the print head. For printer cleaning, refer to **Section 6.2 Maintenance of the Print Head and Platen Roller**.
10	Is the print head defective?	Replace the print head and reset the counter.

No.	What to check	Countermeasure
11	Is the platen roller damaged?	Replace the platen roller.
12	Is the main (CONT) PCB defective?	Replace the main (CONT) PCB. Contact a SATO reseller or technical service center for replacement.

7.4.5 Incorrect Print Position

No.	What to check	Countermeasure
1	Are the media and ribbon designed for use with the printer?	Use media and ribbon designed for the printer.
2	Are the media and ribbon loaded correctly?	Check if the media and ribbon are loaded correctly.
3	Is the media or ribbon deformed?	Use the media or ribbon that is not deformed. You cannot feed the media or ribbon that is deformed.
4	Is the print head installed correctly?	Adjust the print head.
5	Is the media guide set correctly?	Adjust the media guide.
6	Is the correct sensor type set?	Set the correct sensor type.
7	Is the sensitivity of the sensor set correctly?	Adjust the sensor level.
8	Is the offset set correctly?	Adjust the offset.
9	Is the pitch offset or base reference point offset set correctly?	Adjust the pitch offset or base reference point offset.
10	Is the platen roller dirty?	If the platen roller is dirty, clean it using the cleaning kit. For printer cleaning, refer to **Section 6.2 Maintenance of the Print Head and Platen Roller**.
11	Is the media sensor dirty?	If the media sensor is dirty, clean it using the cleaning kit. For printer cleaning, refer to **Section 6.2 Maintenance of the Print Head and Platen Roller**.
12	Is the data or signal sent from the computer incorrect?	Power on the device again. Check the data sent from the computer and communication conditions.
13	Is the platen roller damaged?	Replace the platen roller.

7.5 Interface Troubleshooting

When an interface error occurs on the printer, check with the checklist related to that interface.

7.5.1 USB Interface

No.	Item to check
1	Check that the USB cable is connected correctly.
2	Check that the cable is not damaged.
3	Check the configuration of the printer. Check the setting of the USB interface through the INTERFACE MODE menu.
4	If there are multiple USB ports on the computer, connect to another port.
5	Disconnect other USB devices from the computer.
6	Power on the printer and computer again.
7	Install the USB driver again.

7.5.2 LAN Ethernet Interface

No.	Item to check
1	Check that the LAN cable is connected correctly.
2	Check that the cable is not damaged.
3	Check the configuration of the printer. Check the setting of the LAN Ethernet interface through the INTERFACE MODE menu.
4	Check that the allocated IP address is accessible by PING.
5	Check that the power of the HUB is on.
6	Check that the HUB is not defective.
7	Power on the printer again.

7.5.3 Bluetooth Interface (Optional)

No.	Item to check
1	Check that the Bluetooth function is on.
2	Check that the devices using the same frequency band, such as wireless LAN enabled devices or microwaves are not in use.
3	Check that there is no obstacle such as a metal rack between the printer and the host.
4	Check the configuration of the printer. Check the setting of the Bluetooth interface through the INTERFACE MODE menu.
5	Power on the printer and computer again.
6	Install the Bluetooth driver again.

7.5.4 RS-232C Interface

No.	Item to check
1	Check that the RS-232C cable is connected correctly.
2	Check that the cable is not damaged.
3	Check the configuration of the printer. Check the setting of the RS-232C interface through the INTERFACE MODE menu.
4	If there are multiple RS-232C ports on the computer, connect to another port.
5	Power on the printer and computer again.

7.5.5 IEEE1284 Interface

No.	Item to check
1	Check that the printer cable is connected to the LPT port of the computer correctly.
2	Check that the cable is not damaged.
3	If you are using a Windows printer driver, check that the correct port is selected.
4	Check the configuration of the printer. Check the setting of the IEEE1284 interface through the INTERFACE MODE menu.
5	Connect to another port.
6	Power on the printer again.

7.5.6 External Signal Interface (EXT)

No.	Item to check
1	Check that the printer and external device are connected with a cable correctly.
2	Check that the cable is not damaged.
3	Check that the power of the external device is on.
4	Check the configuration of the printer. Check the setting of the external signal (EXT) interface.
5	Power on the printer and external device again.

7.5.7 Wireless LAN Interface (Optional)

No.	Item to check
1	Check that the wireless LAN function is on.
2	Check that the devices using the same frequency band, such as wireless LAN enabled devices or microwaves are not in use.
3	Check that there is no obstacle such as a metal rack between the printer and the host.
4	Check the configuration of the printer. Check the setting of the wireless LAN interface through the INTERFACE MODE menu.
5	Power on the printer again.

8 Appendix

8.1 List of Initial Values

The initial value refers to the setting value of the printer when it was shipped from the factory.
If you reset the printer in default setting mode, the setting values of the printer will change back to the factory default values. The tables below show the initial value of each setting item and the type of reset that changes the value back to the initial value.

⚠ CAUTION
It is generally not necessary to perform the initialization. Doing so will remove all the customer settings.

8.1.1 Normal Mode

Setting Item	Initial Value	Default (User)	Default (Shipping)
ADJUSTMENT MODE			
PITCH POSITION	Varied	No	No
OFFSET POSITION	Varied	No	No
DARKNESS	50	Yes	No
VOLUME LEVEL	2	Yes	Yes
LCD Brightness	Midrange	Yes	No

8.1.2 User Mode

Setting Item	Initial Value	Default (User)	Default (Shipping)
PRINT SPEED	S84-ex 8 dots/mm: 06 IPS 12 dots/mm: 06 IPS 24 dots/mm: 03 IPS S86-ex 8 dots/mm: 06 IPS 12 dots/mm: 06 IPS	Yes	Yes
PRINT DARKNESS	06	Yes	Yes
PITCH OFFSET	+0.00 mm	Yes	Yes
CHARACTER CODE	UTF-8	Yes	Yes
2 BYTE FONTS	GB18030	Yes	Yes
2 BYTE FONTS	MINCHO	Yes	Yes
NOTIFICATION FUNCTION SETTING	NO	Yes	Yes
NOTICE FUNCTION	CLEAN PRINTER	Yes	Yes

Setting Item	Initial Value	Default (User)	Default (Shipping)
NOTICE FUNCTION	DISABLE	Yes	Yes
CLEAN PRINTER NOTICE DISTANCE	0 m	Yes	Yes
CHANGE ROLLER NOTICE DISTANCE	0 km	Yes	Yes
CHANGE HEAD NOTICE DISTANCE	0 km	Yes	Yes

8.1.3 Interface Mode

Setting Item	Initial Value	Default (User)	Default (Shipping)
INTERFACE AUTO SELECT	DISABLE	Yes	Yes
INTERFACE SETTING	NO	-	-
PORT SELECT	DATA PORT	Yes	Yes
DATA PORT	USB	Yes	Yes
SUB PORT	NONE	Yes	Yes
LAN			
DHCP SETTING	DISABLE	Yes	No
IPv4 ADDRESS	192.168.001.001	Yes	No
IPv4 SUBNET MASK	255.255.255.000	Yes	No
IPv4 GATEWAY ADR	0.0.0.0	Yes	No
IPv6 RESOLUTION	AUTO	Yes	No
IPv6 ADDRESS	0000:0000:0000:0000: 0000:0000:0000:0000	Yes	No
PREFIX LENGTH	64	Yes	No
DEFAULT ROUTER	0000:0000:0000:0000: 0000:0000:0000:0000	Yes	No
PORT NUMBER1	1024	Yes	No
PORT NUMBER2	1025	Yes	No
PORT NUMBER3	9100	Yes	No
PROTOCOL	STATUS5	Yes	Yes
ITEM NO. CHECK	DISABLE (When STATUS5 is selected)	Yes	Yes
BCC CHECK	DISABLE (When STATUS5 is selected)	Yes	Yes
STATUS REPLY TIMING	ENQ (When STATUS4 is selected)	Yes	Yes

Setting Item	Initial Value	Default (User)	Default (Shipping)
WLAN			
DHCP SETTING	DISABLE	Yes	No
IPv4 ADDRESS	192.168.001.001	Yes	No
IPv4 SUBNET MASK	255.255.255.000	Yes	No
IPv4 GATEWAY ADR	192.168.001.002	Yes	No
WIRELESS MODE	Ad Hoc	Yes	No
SSID	SATO_PRINTER	Yes	No
CHANNEL	06	Yes	No
PROTOCOL	STATUS5	Yes	Yes
ITEM NO. CHECK	DISABLE (When STATUS5 is selected)	Yes	Yes
BCC CHECK	DISABLE (When STATUS5 is selected)	Yes	Yes
STATUS REPLY TIMING	ENQ (When STATUS4 is selected)	Yes	Yes
IEEE1284			
PROTOCOL	STATUS5	Yes	Yes
ITEM NO. CHECK	DISABLE (When STATUS5 is selected)	Yes	Yes
BCC CHECK	DISABLE (When STATUS5 is selected)	Yes	Yes
RECEIVE BUFFER	1ITEM (When STATUS4 is selected)	Yes	Yes
IEEE1284 ACK SIGNAL	00.5us (When 1ITEM is selected)	Yes	Yes
RS-232C			
BAUDRATE	19200	Yes	Yes
PARITY BIT	NONE	Yes	Yes
STOP BIT	1 BIT	Yes	Yes
CHARACTER BIT	8 BIT	Yes	Yes
PROTOCOL	STATUS5	Yes	Yes
ITEM NO. CHECK	DISABLE (When STATUS5 is selected)	Yes	Yes
BCC CHECK	DISABLE (When STATUS5 is selected)	Yes	Yes
RECEIVE BUFFER	1ITEM (When READY/BUSY, XON/XOFF is selected)	Yes	Yes
USB			
Protocol	STATUS5	Yes	Yes
ITEM NO. CHECK	DISABLE (When STATUS5 is selected)	Yes	Yes
BCC CHECK	DISABLE (When STATUS5 is selected)	Yes	Yes

Setting Item	Initial Value	Default (User)	Default (Shipping)
Bluetooth			
Authentication Level	NONE	Yes	Yes
PIN CODE	0000000000000000	Yes	Yes
DEVICE NAME	SATO_PRINTER	Yes	Yes
DISCOVERY SETTING	ENABLE	Yes	Yes
PARAMETER SETTING(ISI)	0800	Yes	Yes
PARAMETER SETTING(ISW)	0012	Yes	Yes
PARAMETER SETTING(PSI)	0800	Yes	Yes
PARAMETER SETTING(PSW)	0012	Yes	Yes
PROTOCOL	STATUS4	Yes	Yes
CRC CHECK	DISABLE	Yes	Yes
IGNORE CR/LF	NO	Yes	Yes
IGNORE CAN/DLE	NO (When STATUS4, MULTI is selected in IEEE1284)	Yes	Yes
SNTP FUNCTION	DISABLE	Yes	No
IPv4/6 select	IPv4	Yes	No
NTP IPv4 ADDRESS NTP IPv6 ADDRESS	IPv4: 000.000.000.000 IPv6: 0000:0000:0000:0000: 0000:0000:0000:0000	Yes	No
TIME ZONE	00:00	Yes	No
ERROR NOTICE	DISABLE	Yes	No
SNMP FUNCTION	DISABLE	Yes	No
SNMP SETTING			
COMMUNITY NAME	SNMP v1/v2c[1] : public SNMP v1/v2c[2] : NULL	No	No
COMMUNITY WRITE	DISABLE	No	No
USER NAME	Null	No	No
AUTH PROTOCOL	NONE	No	No
AUTH KEY	Null	No	No
PRIVACY PROTOCOL	NONE	No	No
PRIVACY KEY	Null	No	No
USER MIB WRITE	DISABLE	No	No
TRAP SET			
TRAP TYPE SELECT	SNMPv2c	No	No
TRAP	DISABLE	No	No
COMMUNITY NAME	Null	No	No

Setting Item	Initial Value	Default (User)	Default (Shipping)
TRAP SET			
USER NAME	Null	No	No
AUTH PROTOCOL	NONE	No	No
AUTH KEY	Null	No	No
PRIVACY PROTOCOL	NONE	No	No
PRIVACY KEY	Null	No	No
IPv4/6 select	IPv4	No	No
TRAP IPv4 ADR	000.000.000.000	No	No
TRAP IPv6 ADR	0000:0000:0000:0000: 0000:0000:0000:0000	No	No

8.1.4 Memory Mode

Setting Item	Initial Value	Default (User)	Default (Shipping)
SLOT SETTING	NO	Yes	Yes
CARD SLOT SELECT SLOT0	RAM	Yes	Yes
CARD SLOT SELECT SLOT1	FROM	Yes	Yes
CARD SLOT SELECT SLOT2	SD	Yes	Yes
MEMORY MODE	MEMORY SIZE	-	-
STORED CONTENTS	FORM OVERLAY	-	-
MEMORY FORMAT	NO	-	-
FORMAT START	NO	-	-

8.1.5 Advanced Mode

Setting Item	Initial Value	Default (User)	Default (Shipping)
PRINTER TYPE	DISPENSER	Yes	Yes
BACKFEED MOTION	BEFORE	Yes	Yes
PRINT METHOD	TRANSFER (Set to DIRECT with direct thermal model)	Yes	Yes
PITCH SENSOR	ENABLE (When CONTINUOUS is selected)	Yes	Yes
SENSOR TYPE	GAP	Yes	Yes
COMMAND ERROR	DISABLE	Yes	Yes

Setting Item	Initial Value	Default (User)	Default (Shipping)
HEAD CHECK	DISABLE	Yes	Yes
HEAD CHECK	NORMAL (When HEAD CHECK is enabled)	Yes	Yes
HEAD CHECK MODE	ALL (When HEAD CHECK is enabled)	Yes	Yes
HEAD CHECK PAGE NO.	000001 (When CHECK PAGE is selected)	Yes	Yes
EXTERNAL SIGNAL SETTING	NO	-	-
EXTERNAL SIGNAL	ENABLE	Yes	Yes
EXTERNAL SIGNAL	TYPE4	Yes	Yes
EXTERNAL REPRINT	DISABLE	Yes	Yes
CONTINUOUS PRINT	DISABLE	Yes	Yes
ENHANCED REPRINT	DISABLE	Yes	Yes
I/O SIGNAL SETTING	NO	-	-
INPUT SIGNAL			
PRINT START	20Pin	Yes	Yes
REPRINT	8Pin	Yes	Yes
LABEL NEAR	7Pin	Yes	Yes
FEED	21Pin	Yes	Yes
OUTPUT SIGNAL			
PAPER END	17Pin	Yes	Yes
RIBBON END	16Pin	Yes	Yes
MACHINE ERR	4Pin	Yes	Yes
PRINT END	5Pin	Yes	Yes
ONLINE	6Pin	Yes	Yes
RIBBON NEAR	18Pin	Yes	Yes
DECIDED?	NO	-	-
I/O SIGNALS INITIALIZE	NO	-	-
ZERO SLASH	YES	Yes	Yes
AUTO ONLINE	YES	Yes	Yes
PRINT OFFSET	V:+0000 H:+0000	Yes	Yes
HEAD DOT DENSITY	300, only for S84-ex/S86-ex (12 dots/mm)	Yes	Yes

Setting Item	Initial Value	Default (User)	Default (Shipping)
SET CALENDAR	NO	-	-
CALENDAR	11/01/01 00:00	No	Yes
CALENDAR INPUT	11/01/01 00:00	No	Yes
CALENDAR DAY OF WEEK CODE	SUNDAY 1 MONDAY 2 TUESDAY 3 WEDNESDAY 4 THURSDAY 5 FRIDAY 6 SATURDAY 7	No	Yes
CALENDAR MONTH CODE	JANUARY A FEBRUARY B MARCH C APRIL D MAY E JUNE F JULY G AUGUST H SEPTEMBER J OCTOBER K NOVEMBER L DECEMBER M	No	Yes
CALENDAR CASE FORMAT	MIXED	No	Yes
CALENDAR CHECK	DISABLE	Yes	Yes
CHARACTER PITCH	PROPORTIONAL	Yes	Yes
PROTOCOL CODE	STANDARD	Yes	Yes
NON STANDARD CODE SETTING	STX=7Bh, ETX=7Dh, ESC=5Eh, ENQ=40h, CAN=21h, NULL=7Eh, OFFLINE=5Dh	Yes with Default (ALT. PROTOCOL)	
RIBBON SAVER	DISABLE	Yes	Yes
MODE SELECT	SBPL	Yes	Yes
JOB MODIFICATION	DISABLE	No	Yes
ROTATE LABEL DEG:	0	Yes	Yes
LABEL SIZE ADJ WIDTH:	S84-ex 8 dots/mm: 0832 12 dots/mm: 1248 24 dots/mm: 2496 S86-ex 8 dots/mm: 1340 12 dots/mm: 2010	Yes	Yes
LABEL SIZE ADJ HEIGHT:	S84-ex 8 dots/mm: 20000 12 dots/mm: 18000 24 dots/mm: 9600 S86-ex 8 dots/mm: 9992 12 dots/mm: 14988	No	No
IGNORE A1	NO	Yes	Yes

Setting Item	Initial Value	Default (User)	Default (Shipping)
LCD POWER SAVING	00 MIN	Yes	Yes
LED INDICATION	ON	Yes	Yes
ERROR INDICATION	NONE	Yes	Yes

8.1.6 Hex Dump Mode

Setting Item	Initial Value	Default (User)	Default (Shipping)
SELECT DUMP DATA	RECEIVE DATA	-	-
HEX DUMP	NORMAL	-	-

8.1.7 RFID User Mode

Setting Item	Initial Value	Default (User)	Default (Shipping)
RFID LIFE COUNT SUCCESS	000000	-	-
RFID LIFE COUNT FAILURE	000000	-	-
RFID LIFE COUNT TOTAL	000000	-	-
RFID COUNT SUCCESS	000000	No	Yes
RFID COUNT FAILURE	000000	No	Yes
RFID COUNT TOTAL	000000	No	Yes
CLEAR RFID COUNT	NO	-	-
RFID LABEL DATA	RETRY	No	Yes
MAX ERR COUNT	1 TIME(S)	No	Yes
RFID ERR SLASH	YES	No	Yes
RFID ERR OUTPUT	LEVEL	No	Yes
LENGTH OF PULSE	100 msec	No	Yes
VIEW EPC DATA/ VIEW TID DATA/ VIEW USER DATA/ VIEW PC DATA	NO	-	-
ANTENNA PITCH	STANDARD	No	No
RFID TAG OFFSET	0 mm	No	Yes
WRITE POWER	10.0 dBm	No	Yes
READ POWER	10.0 dBm	No	Yes
LOG	DISABLE	No	Yes
LOG Data	EPC and TID	No	Yes

Setting Item	Initial Value	Default (User)	Default (Shipping)
MCS	DISABLE	No	Yes
Pre-Encoded Tag	DISABLE	No	Yes
Chip Manufacture	IMPINJ	No	Yes
MCS Prefix	AUTO	No	Yes
MCS Prefix Digit	0 DIGIT(S)	No	Yes
MCS Prefix Data	0	No	Yes

8.1.8 Test Print Mode

Setting Item	Initial Value	Default (User)	Default (Shipping)
TEST PRINT MODE	CONFIGURATION	-	-
TEST PRINT SIZE	S84-ex: 10 cm S86-ex: 16 cm (When CONFIGURATION, BARCODE, HEAD CHECK is selected)	-	-
	LARGE (When FACTORY, WLAN is selected)	-	-
LABEL LENGTH	10cm (When CONFIGURE LIST is selected)	-	-
PITCH POSITION	Varied	No	No
OFFSET POSITION	Varied	No	No
DARKNESS	50	Yes	No

8.1.9 Default Setting Mode

Setting Item	Initial Value	Default (User)	Default (Shipping)
DEFAULT MODE	PRINTER SETTING	-	-
DEFAULT PRINTER SETTING	NO	-	-
DEFAULT ALT.PROTOCOL	NO	-	-
DEFAULT WLAN SETTING	NO	-	-

8.1.10 Service Mode

Setting Item	Initial Value	Default (User)	Default (Shipping)
SERVICE MODE	SENSOR LEVEL	-	-
SETTING			
AUTO ONLINE FEED	NO	Yes	Yes
FEED ON ERROR	NO	Yes	Yes
FUNCTION KEY	NONE	Yes	No
REPRINT W/FEED	NO	Yes	Yes
CALENDAR REPRINT	YES	Yes	No
FORWARD/BACKFEED DISTANCE	DEFAULT	Yes	No
EXT 9PIN SELECT	MODE1	Yes	No
BACKFEED SPEED	FAST	Yes	Yes
EURO CODE	D5	No	No
SELECT LANGUAGE	ENGLISH	Yes	Yes
PRIORITY SETTING	COMMAND	Yes	No
RIBBON NEAR END	ENABLE	Yes	No
LABEL RE-DETECT	ENABLE	Yes	Yes
SET PASSWORD	OFF	-	-
PASSWORD NO.	0000	No	No
COMPATIBLE MODE	OFF	Yes	No
COMPATIBLE MODE HEAD SIZE	NORMAL	Yes	No
COMPATIBLE MODE DARKNESS	ENABLE	Yes	No
PRINTER MODEL	S84-ex: S84/M8459Se S86-ex: M8485/90/60/65Se	Yes	No
MEDIA LENGTH	S84-ex 8 dots/mm: 2500 mm 12 dots/mm: 1500 mm 24 dots/mm: 400 mm S86-ex: 1249 mm	Yes	No
TRACE MODE	DISABLE	Yes	No
SAVE PRINT LOG	DISABLE	Yes	No
MEMORY SELECT	SD CARD	Yes	No
CLEAR PRINT LOG	NO	-	-
OUTPUT PRINT LOG FROM SUBPORT	DISABLE	Yes	No

Setting Item	Initial Value	Default (User)	Default (Shipping)
RIBBON TENSION ADJUSTMENT	S84-ex 8 dots/mm: 12 12 dots/mm: 5 24 dots/mm: 1 S86-ex 8 dots/mm: 12 12 dots/mm: 5	Yes	No
THROUGHPUT	NORMAL	Yes	Yes
FEED OFFSET	000 mm	Yes	Yes
BACKFEED OFFSET	000 mm	Yes	Yes
TOTAL QTY DISPLAY	NO	Yes	No
PLUG & PLAY	ENABLE	Yes	No
REGION CODE	US	Yes	No
REPLY PERIOD	NORMAL	Yes	No
ENQ REPLY DELAY TIME	0000 ms	Yes	No
FONT SELECT			
GB18030	YES	Yes	No
BIG5	YES	Yes	No
KSX101	YES	Yes	No
HEAD SELECT	S86-ex(8 dots/mm): KST-172-8TAO8- S86-ex(12 dots/mm): KPJ-168-12TAO8- (only for S86-ex series)	No	No

8.1.11 Hidden Setting Mode

Setting Item	Initial Value	Default (User)	Default (Shipping)
LABEL OUT SENSOR	YES	Yes	No
SHIFT CODE	NO	No	Yes

8.1.12 Work Shift Setting Mode

Setting Item	Initial Value	Default (User)	Default (Shipping)
SELECT SHIFT	1	No	Yes
ENTER SHIFT TIME	24:00	No	Yes
HOW MANY CHR?	01	No	Yes
ENTER SHIFT NAME	<space>	No	Yes

8.1.13 Simple Standalone Mode

Setting Item	Initial Value	Default (User)	Default (Shipping)
STANDALONE MODE	LOAD	-	-
OUTPUT LABEL QTY	000001	-	-

8.1.14 Wireless LAN Setting

Setting Item	Overview	Contents	Default (WLAN)	Initial Value
MACAddress	MAC address	Not configurable	No	NULL
IPSetupMethod	DHCP/BOOTP setting	0: DISABLE 1: ENABLE	Yes	DISABLE
LocalIPAddress	IP Address	xxx.xxx.xxx.xxx	Yes	192.168.1.1
SubnetMask	Subnet Mask	xxx.xxx.xxx.xxx	Yes	255.255.255.0
GatewayAddress	Gateway Address	xxx.xxx.xxx.xxx	Yes	192.168.1.2
DNSPrimaryIPAddress	DNS primary address	xxx.xxx.xxx.xxx	Yes	0.0.0.0
DNSSecondaryIPAddress	DNS secondary address	xxx.xxx.xxx.xxx	Yes	0.0.0.0
WLANMode	Wireless LAN mode setting	0: Ad Hoc mode 1: Infrastructure mode	Yes	Ad Hoc mode
ESSID	SSID	1 - 32 characters	Yes	“SATO_PRINTER”
Channel	Channel number	1 - 13	Yes	6
WLANNetworkAuth	Network authentication	0: Open System 1: Shared Key 2: WPA 3: WPA2	Yes	Open System
WEPKeyUse	WEP key OFF/ON	0: DISABLE 1: ENABLE	Yes	DISABLE
WEPKey1	WEP key 1	5 or 13 characters 10 or 26 digits in hex	Yes	“B”
WEPKey2	WEP key 2	5 or 13 characters 10 or 26 digits in hex	Yes	“B”
WEPKey3	WEP key 3	5 or 13 characters 10 or 26 digits in hex	Yes	“B”
WEPKey4	WEP key 4	5 or 13 characters 10 or 26 digits in hex	Yes	“B”
WEPKeyIndex	WEP Key Index	1 - 4	Yes	1
EAPAuth	802.1x authentication OFF/ON	0: DISABLE 1: ENABLE	Yes	DISABLE

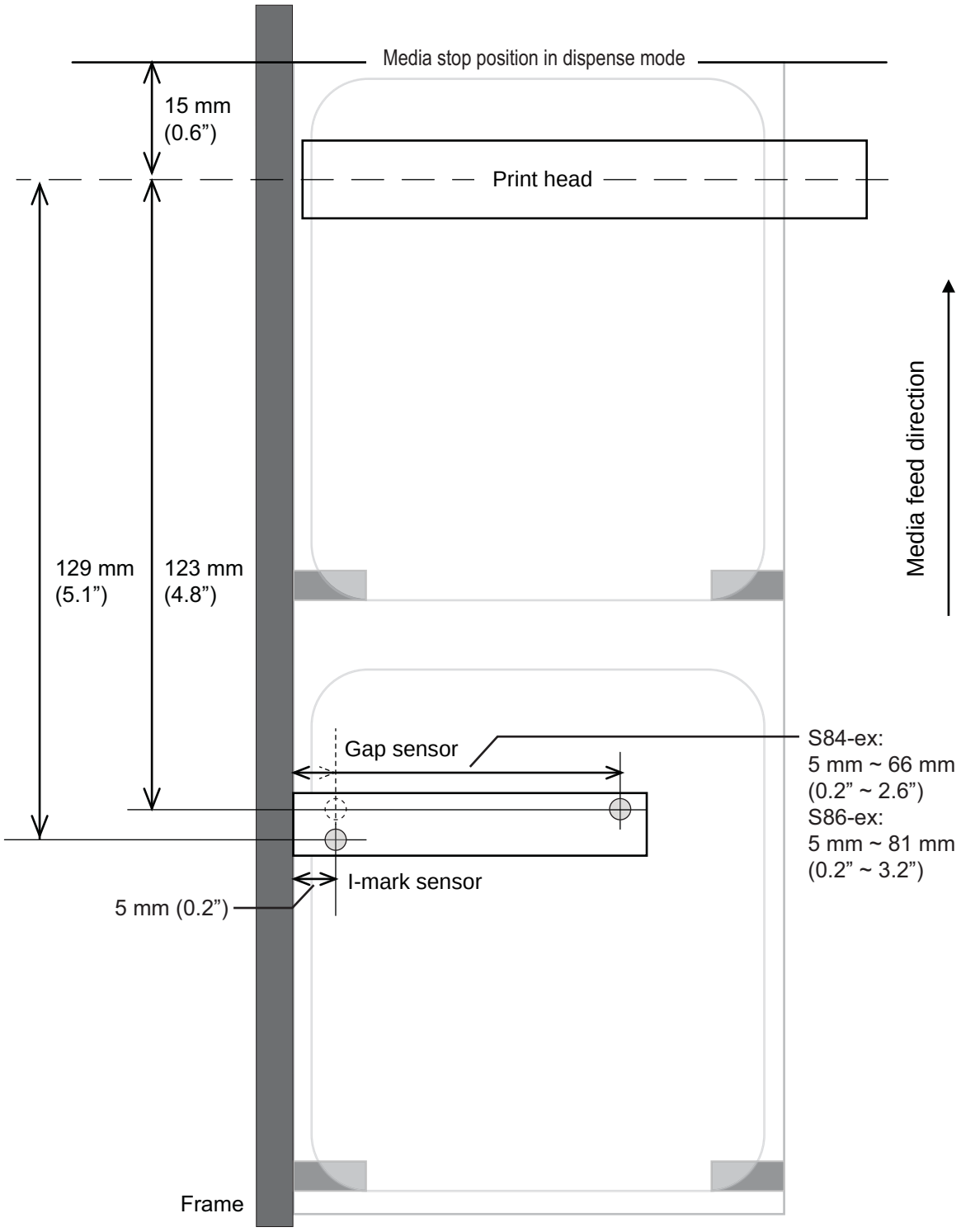
Setting Item	Overview	Contents	Default (WLAN)	Initial Value
EAPAuthMode	802.1x authentication	0: LEAP 1: EAP-TLS 2: EAP-TTLS 3: EAP-PEAP 4: EAP-FAST	Yes	EAP-TLS
WPAauthentication	WPA/WPA2 Authentication setting	0: PSK 1: EAP	Yes	PSK
WPAPSKMode	WPA/WPA2 Encryption Method setting	0: TKIP 1: AES	Yes	TKIP
WPAPSK	Advanced shared key	8 - 63 characters	Yes	“sato printer”
EAPUserName	EAP authenticated user name	0 - 64 characters	Yes	NULL
EAPPassword	EAP Authentication password	0 - 32 characters	Yes	NULL
EAPCertKeyPassword	EAP password for secret key acquisition	0 - 32 characters	Yes	NULL
EAPCertRoot	CA route certification file size	File size	No	0
WPAEAPAuthMode	WPA802.1x authentication	0: LEAP 1: EAP-TLS 2: EAP-TTLS 3: EAP-PEAP 4: EAP-FAST	Yes	EAP-TLS
WPAEAPUserName	WPAEAP authenticated user name	0 - 64 characters	Yes	NULL
WPAEAPPassword	WPAEAP Authentication password	0 - 32 characters	Yes	NULL
EAPTTLSInAuth	TTLS internal authentication	0: PAP 1: CHAP 2: MSCHAP 3: MSCHAPv2	Yes	PAP
EAPTTLSServerAuth	TTLS server authentication	0: OFF 1: ON	Yes	OFF
EAPPEAPInAuth	PEAP internal authentication	0: MSCHAPv2	Yes	MSCHAPv2
EAPPEAPServerAuth	PEAP server authentication	0: OFF 1: ON	Yes	OFF
EAPFASTPacAuto	PAC file auto provisioning	0: OFF 1: ON	Yes	OFF
EAPCertKey	File size of the secret key	File size	No	0
WLANRegionCode	Regional code	0: specified value of the module (JP) 1: US 2: Canada 3: Europe 4: Malaysia 5: Singapore 6: Korea 7: China 8: Japan	No	US

Setting Item	Overview	Contents	Default (WLAN)	Initial Value
RoamingThreshold	Threshold for roaming condition	-94 to -35 (dBm)	Yes	80
AssociationThreshold	Threshold for association process	-94 to -35 (dBm)	Yes	85
RoamingScanWaitTime	The time from scan end to scan start	3 - 300 (sec)	Yes	300
WLANPeriodicArpInterval	ARP packet send intervals for monitoring the connection status with AP	3000 - 60000 (ms)	Yes	3000
WLANBeaconLostCount	Detected disconnection count number by beacon lost of the access point	1 - 60	Yes	15
EAPPreAuth	Enable/Disable the EAP advanced authentication	0: DISABLE 1: ENABLE	Yes	DISABLE
FtpEnableLoginAccount	FTP authentication method	0: OFF (No user authentication) 1: ON (User authentication)	Yes	OFF
FtpLoginUser	FTP login user name	1 - 32 characters	Yes	“guest”
FtpLoginPassword	Password for the FTP login user	0 - 32 characters	Yes	“guest”
FtpDiscTimeout	Disconnected timeout time of the control connection	10 - 900 (sec)	Yes	30
RawProtocol	Communication protocol	0: Status 4 (cycle response) 1: Status 4 (ENQ response) 2: Status 3/5	Yes	Status 5
RawRecvBufferSize	Receive buffer size	4096	Yes	4096
RawDiscTimeout	Disconnection timeout	0 - 3600 (sec)	Yes	60
RawEnableDiscTimeout	ENABLE/DISABLE disconnection timeout	0: DISABLE 1: ENABLE	Yes	ENABLE
LpdDiscTimeout	Disconnection timeout time	10 - 900 (sec)	Yes	30
WebAppLoginUser	WEB page login user name	0 - 63 characters	Yes	“admin”
WebAppLoginPassword	WEB page login password	0 - 63 characters	Yes	“admin”
Language	Language	0: Japanese 1: English	Yes	English
DebugMode	Debug mode setting	0: DISABLE 1: ENABLE (log + print data)	Yes	DISABLE
SignalLevel1	Field intensity setting threshold 1	Absolute value from 00 to 99	Yes	85
SignalLevel2	Field intensity setting threshold 2	Absolute value from 00 to 99	Yes	74
SignalLevel3	Field intensity setting threshold 3	Absolute value from 00 to 99	Yes	64

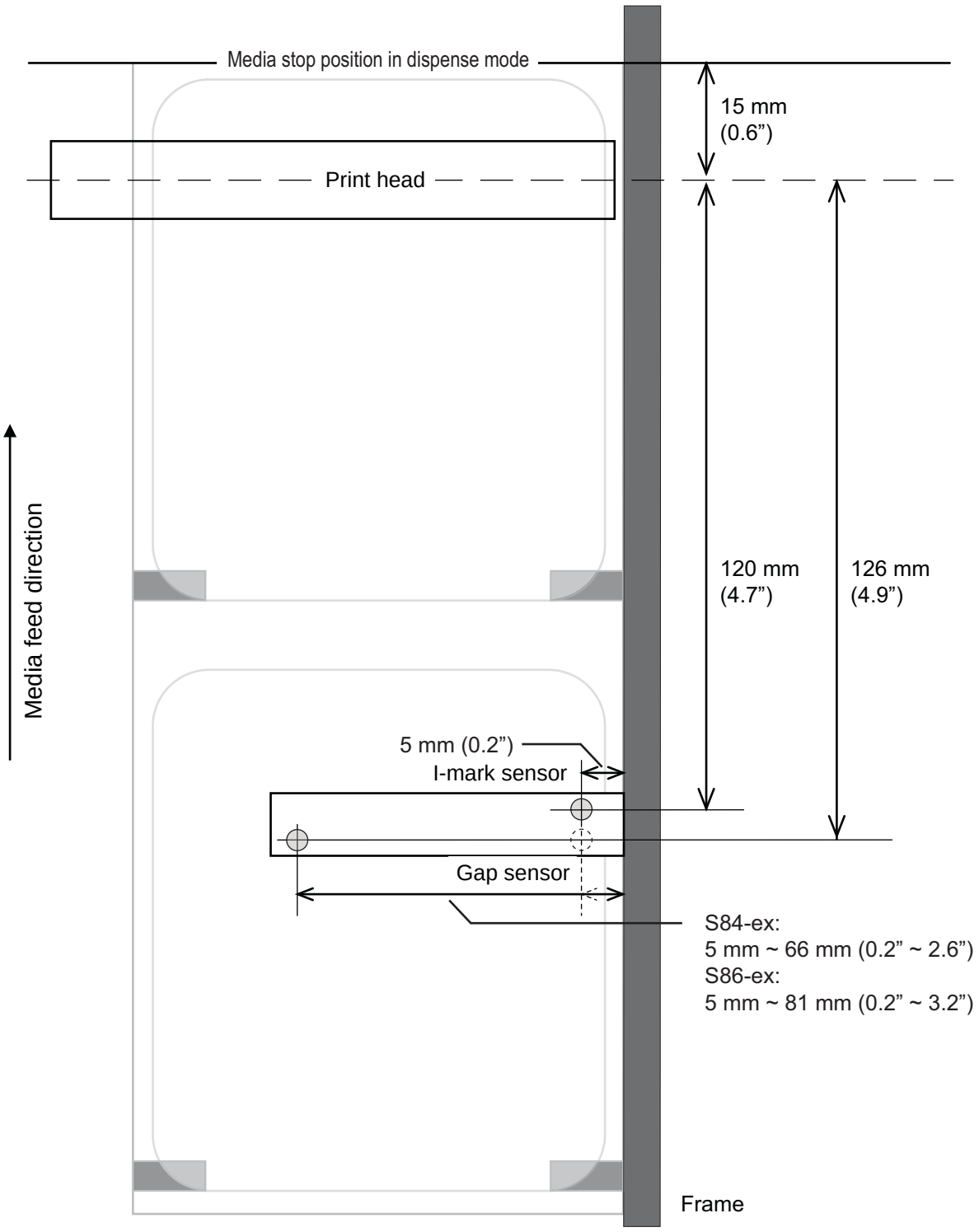
Setting Item	Overview	Contents	Default (WLAN)	Initial Value
FWversion	Firmware version of the WLAN module	x.x.x.	No	NULL
BuildDate	Firmware date of the WLAN module	YYYYMMDD	No	NULL
RootPassword	Login password of the TELNET root user	0 - 16 half-width alphanumeric characters	Yes	NULL
KeepAliveTime	Retry intervals of TCP KeepAlive packet	30 - 300 (sec)	Yes	180
KeepAliveCount	Retry number of TCP KeepAlive packet (times)	1 - 99	Yes	17
FtpClientEnableService	FTP client setting	0: DISABLE 1: ENABLE	Yes	DISABLE
FtpClientLoginUser	FTP client user name	1 - 32 characters	Yes	“sato”
FtpClientLoginPassword	FTP client password	1 - 32 characters	Yes	“sato”
FtpServerIPAddress	FTP server IP address	xxx.xxx.xxx.xxx	Yes	0.0.0.0
FtpServerURL	FTP server URL	0 - 48 characters	Yes	“ftp://sato.co.jp”
FtpServerPort	FTP port number	1 - 65535	Yes	21
FtpConnectRetryPeriod	Reconnection interval	1 - 100	Yes	10
FtpConnectRetryTimes	Reconnection number of retry	0: no retry 1 - 10 255: keep retrying until connected	Yes	5
FtpJobTimeout	Job timeout	0 - 600 (sec)	Yes	300
FtpUsePassiveMode	ENABLE/DISABLE Passive mode	0: DISABLE 1: ENABLE	Yes	DISABLE

8.2 Media Sensor Positions and Media Stop Positions

The media sensor positions and the media stop position are as follows:
S84-ex/S86-ex (Americas: Standard/Right Hand, Europe/Asia: Left Hand) printer:



S84-ex/S86-ex (Americas: Opposite/Left Hand, Europe/Asia: Right Hand) printer:



8.3 About Compatible Mode

When you set the COMPATIBLE MODE to ON in the service mode menu, you can match the printer operation to the existing models.
Refer to **COMPATIBLE MODE** in **Function Settings** of the service mode menu.

8.3.1 Compatible Mode

The following table shows the operation of the compatible mode.

Item	Compatible Mode	
	ON	OFF
Print density change. A function to draw data according to the head density when the head density is 12 dots/mm.	Head dot density setting screen is shown in the advanced mode. - S84-ex Select from 100, 150, 300 - S86-ex Select from 150, 300	No setting screen.
ESC+AX/Print area expansion setting	The command is enabled	The command is disabled. When the printer received the command, the command is discarded without command error.
ESC+AR/Print area standard setting	The command is enabled	The command is disabled. When the printer received the command, the command is discarded without command error.
Graphic printing, partial copy specify <WD>, and white and black inverse printing <(> are not rotated by the rotation specify command <%>.	No rotation.	The image is rotated.
Graphic printing is not enlarged by the enlarge specify command <L>.	Not enlarged.	The image is enlarged.
Graphic printing is not offset by base offset command <A3>.	No offset.	The image is offset.
Outline font setting	The minimum value for the font width: 1 (dot) The minimum value for the font height: 1 (dot)	The minimum value for the font width: 24 (dot) The minimum value for the font height: 24 (dot)
When EAN8 is specified with barcode setting (ratio 2:5) <BD>, auto human readable character is not printed with all bar ratio.	No human readable characters.	Human readable characters are printed.
When EAN13/UPC-A is specified with barcode setting (ratio 2:5) <BD>, auto human readable character is not printed with all bar ratio (only for 8 dots/mm).	No human readable characters.	Human readable characters are printed.

Item	Compatible Mode	
	ON	**OFF**
When EAN13/UPC-A is specified with barcode setting, auto human readable character is not printed with other than quadruple bar ratio in <BD>, and with more than quintuple in <D> (only for 12 dots/mm).	No human readable characters.	Human readable characters are printed.
When the barcode type of barcode setting <B>, <D>, <BD> is specified to EAN8, the print data input digit is fixed to 8 digits.	The input digit is fixed to 8 digits.	The input digit is according to the command specification.
When the barcode type of barcode setting <B>, <D>, <BD> is specified to EAN13/ UPC-A, the print data input digit is fixed to 13 digits. (Only when 8 dots/mm)	The input digit is fixed to 13 digits.	The input digit is according to the command specification.
When an odd number digit is specified in the START CODE C with CODE128 barcode setting <BG>, “0” is added to the trailing edge of the data and printed.	The data is printed (“0” is added).	The data is not printed (command error).
The default value of the print area (vertical)	178 mm	2500 mm

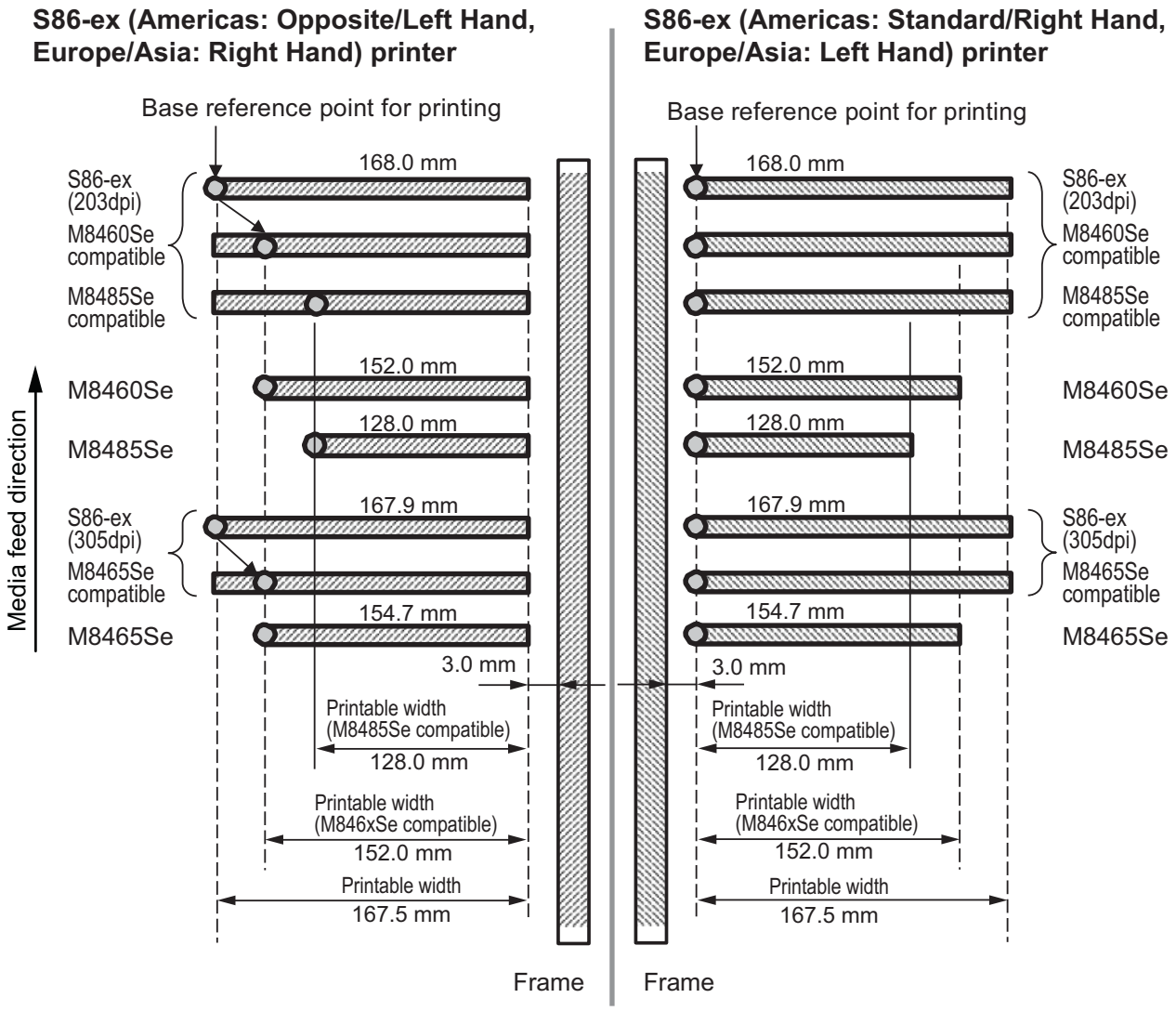
8.3.2 Compatible Mode - Print Head Width (only for S86-ex printer)

The following table shows the operation of the compatible mode (print head width).

Item	S86-ex (203 dpi)			S86-ex (305 dpi)	
	NORMAL	**M8460Se**	**M8485Se**	**NORMAL**	**M8465Se**
Printable width	167.5 mm (6.59”)	152.0 mm (5.98”)	128.0 mm (5.04”)	167.5 mm (6.59”)	152.0 mm (5.98”)
The maximum print position offset setting (dot)	1340	1216	1024	2010	1824
Label size adjustment (width) • Maximum value (dot)	1340	1216	1024	2010	1824
The maximum print horizontal position setting <H> (dot)	1340	1216	1024	2010	1824
Ruled line, frame border print setting <FW> • The maximum length of the border line (dot)	1340	1216	1024	2010	1824
White and black inverse printing setting <(> • The maximum value for the horizontal inverse area (dot)	1340	1216	1024	2010	1824
Copy within label <WD> • The maximum value for the horizontal direction (dot)	1340	1216	1024	2010	1824

Item	S86-ex (203 dpi)			S86-ex (305 dpi)	
	NORMAL	**M8460Se**	**M8485Se**	**NORMAL**	**M8465Se**
Mirror rotation setting <RM> • The maximum value for the horizontal direction (dot)	1340	1216	1024	2010	1824
Graphics print <G> • The maximum byte for the horizontal direction	168	152	128	252	228
Media size <A1> • The maximum label width (dot)	1340	1216	1024	2010	1824
Base offset setting <A3> • The maximum value for the horizontal direction offset (dot)	1340	1216	1024	2010	1824
Printer operation register setting <PG> • The maximum label width (dot)	1340	1216	1024	2010	1824
Printer operation register setting <PC> • The maximum label width (dot)	1340	1216	1024	2010	1824
Form overlay registration <&S> • The maximum horizontal direction available range (dot)	1340	1216	1024	2010	1824
Graphics registration <GI> • The maximum byte for the horizontal direction	168	152	128	252	228
Print configuration request <SOH+MG> • The maximum label width (dot)	1340	1216	1024	2010	1824
Print configuration request <SOH+MG> • The maximum offset value for the horizontal base point (dot)	1340	1216	1024	2010	1824

8.3.3 Print Head Width and Printable Area Range

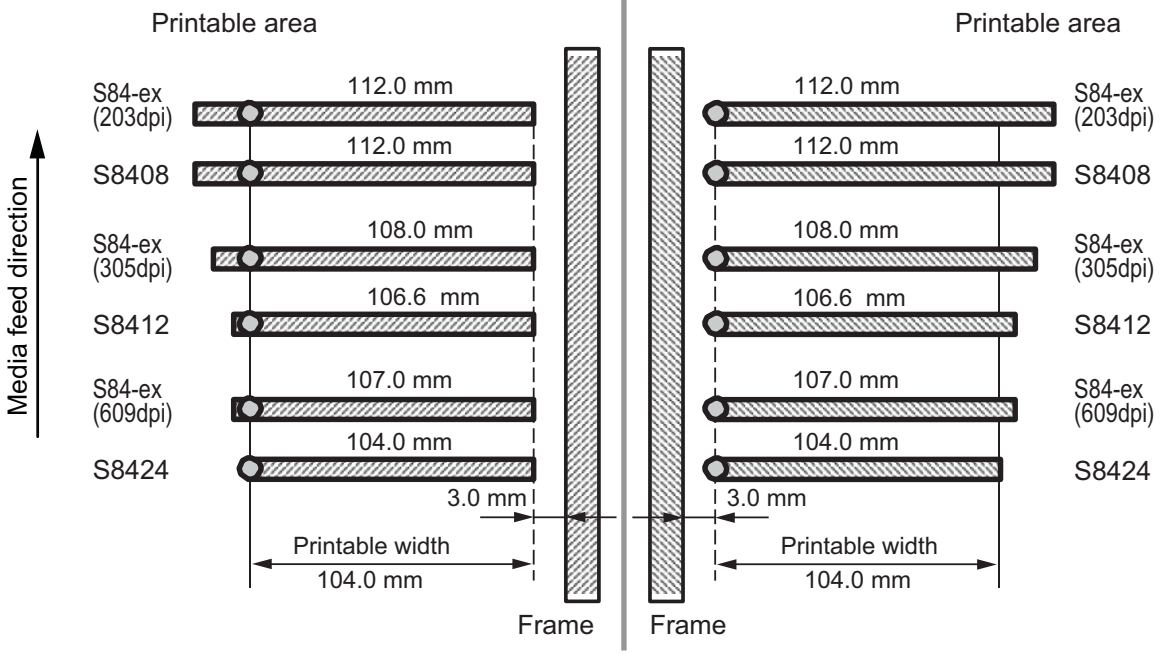


Print head width and printable width

Print Head Density	S86-ex		M8460Se/M8465Se		M8485Se	
	Print Head Width	Printable Width	Print Head Width	Printable Width	Print Head Width	Printable Width
8 dots/mm (203 dpi)	168 mm (6.61”)	167.5 mm (6.59”)	152 mm (5.98”)	152 mm (5.98”)	128 mm (5.04”)	128 mm (5.04”)
12 dots/mm (305 dpi)	167.9 mm (6.61”)	167.5 mm (6.59”)	154.7 mm (6.09”)	152 mm (5.98”)	-	-

S84-ex (Americas: Opposite/Left Hand, Europe/Asia: Right Hand) printer

S84-ex (Americas: Standard/Right Hand, Europe/Asia: Left Hand) printer



Print head width and printable width

Print Head Density	S84-ex		S8400	
	Print Head Width	Printable Width	Print Head Width	Printable Width
8 dots/mm (203 dpi)	112 mm (4.41”)	104 mm (4.09”)	112 mm (4.41”)	104 mm (4.09”)
12 dots/mm (305 dpi)	108 mm (4.25”)	104 mm (4.09”)	106.6 mm (4.2”)	104 mm (4.09”)
24 dots/mm (609 dpi)	107 mm (4.21”)	104 mm (4.09”)	104 mm (4.09”)	104 mm (4.09”)

8.4 LCD Power Saving Mode

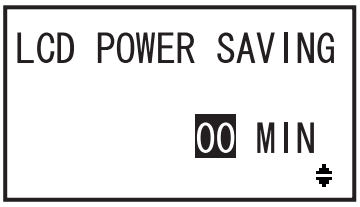
This function is designed to reduce power consumption by setting the LCD backlight to off when the printer is not operated for a specified period of time. The time required for the LCD backlight to light off can be set at LCD POWER SAVING setting screen in the advanced mode.
Refer to **Section 4.2.13 Advanced Mode** for the flowchart to access the setting. The setting procedure of the LCD power saving mode is as follows:

1 In offline mode, press the ↵ **ENTER** button.

The printer changes to setting mode menu.

2 Select the **ADVANCED MODE** using the ▲/▼/◄/► buttons and then press the ↵ **ENTER** button.

3 Press the ↵ **ENTER** button again until LCD POWER SAVING shows on the screen.



4 Press the ▲/▼ buttons to select a value.

The setting range is from 00 to 15 MIN.
When “00” is selected, this function is disabled and the LCD backlight is always on.

5 Press the ↵ **ENTER** button to save the setting.

Conditions to set the LCD backlight to off

Under the following conditions, the LCD backlight lights off when the time specified on the LCD POWER SAVING setting screen has elapsed. With this function, only the LCD backlight lights off and the on-screen message remains the same.

- The printer has not received the print data* (ESC+A to ESC+Z) in various interfaces.
  * Each protocol’s status return request, cancel request and incorrect data are omitted.
- No button is pressed.
- The printer is not in error mode.
- The printer is neither printing nor feeding media.
- The printer is in online mode, offline mode or hex dump mode.
  This function is disabled in download mode.

Conditions to set the LCD backlight to on

Any of the following conditions will light the LCD backlight on again.

- The printer receives the print data* from various interfaces.
  * Each protocol’s status return request, cancel request and incorrect data are omitted.
- Any button on the operator panel is pressed.
- Printer error such as “Head open” occurs.
- The printer starts the printing operation.

Pressing any button while the LCD backlight is off will only light the LCD backlight back on. The function of the button is invalid.
(For example, the printer does not go offline by pressing the ⏯ **LINE** button when the LCD backlight is off in online mode.)

8.5 Input/Output Signal of the External Signal

This section provides additional information about setting the pin number of the input/output signal in the **INPUT SIGNAL/OUTPUT SIGNAL** screen of the advanced mode menu.

Setting Conditions

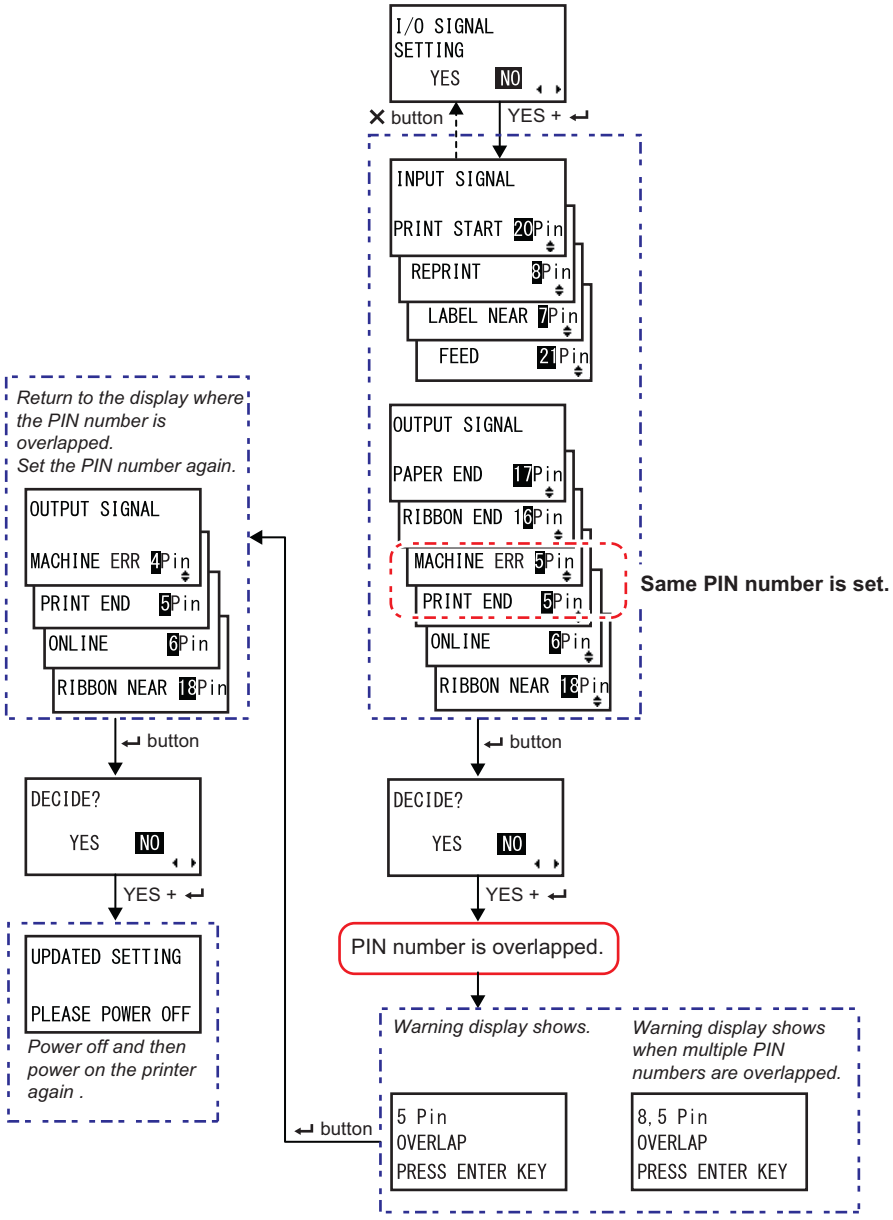
Signal Name	Input/Output	Pin No. (Default Value)	Overlapping	Available Pin No.
PRINT START	Input	20	Not Allowed	20, 8
Reprint	Input	8	Not Allowed	
FEED	Input	21	Not Allowed	21, 7, - Note: When “-” is selected, the function is disabled.
LABEL NEAR	Input	7	Not Allowed	
Paper End	Output	17	Allowed	4, 5, 6, 16, 17, 18, - Note: When “-” is selected, there is no output.
Ribbon End	Output	16	Allowed	
MACHINE ERR	Output	4	Allowed	
PRINT END *1	Output	5	Not Allowed	
ONLINE	Output	6	Allowed	
RIBBON NEAR	Output	18	Allowed	

*1 You cannot select “-” for the PRINT END output signal.

Note

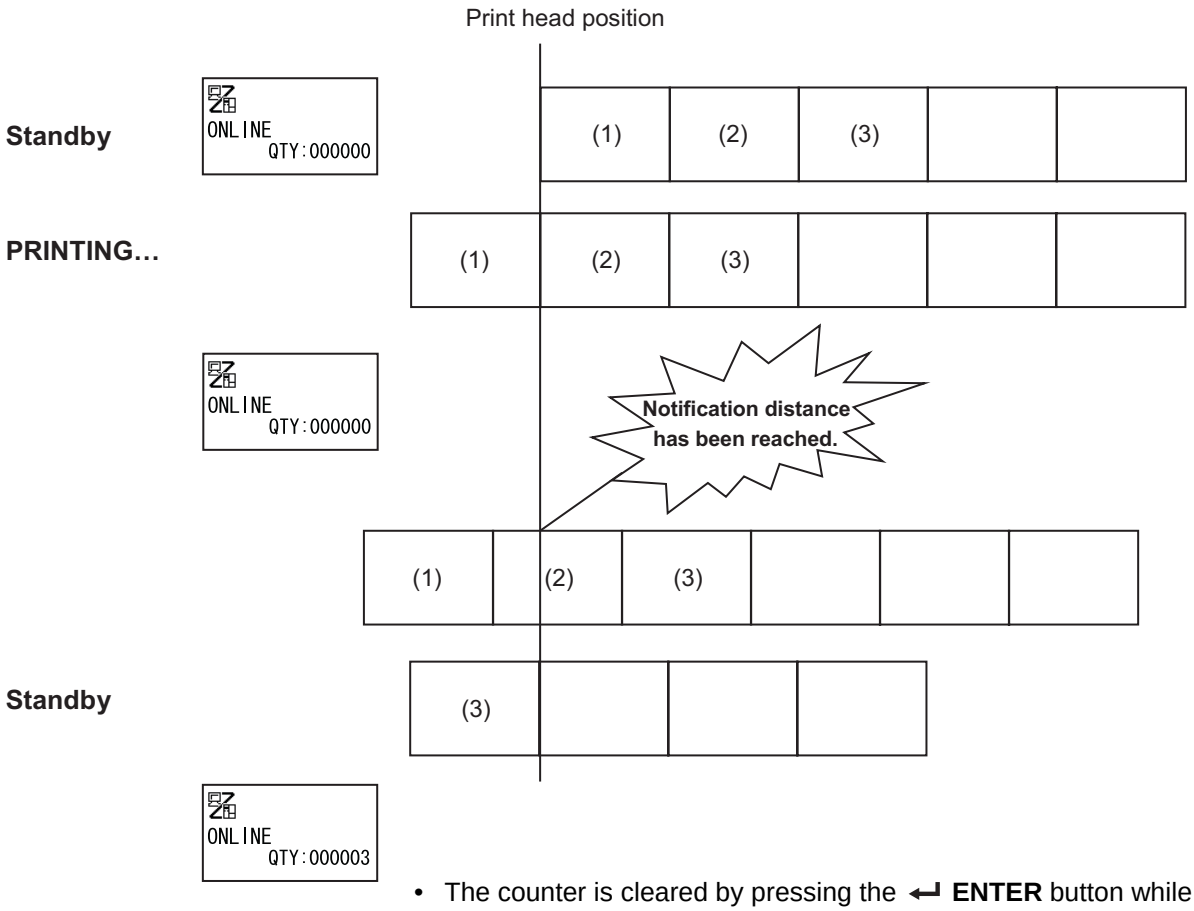
- When multiple errors are allocated to one pin, the signal is output when one of the errors occurs.
- All errors need to be released in order to switch the signal output back to normal.

When the PIN number is overlapped in the Input/Output signal setting



8.6 Notification Function

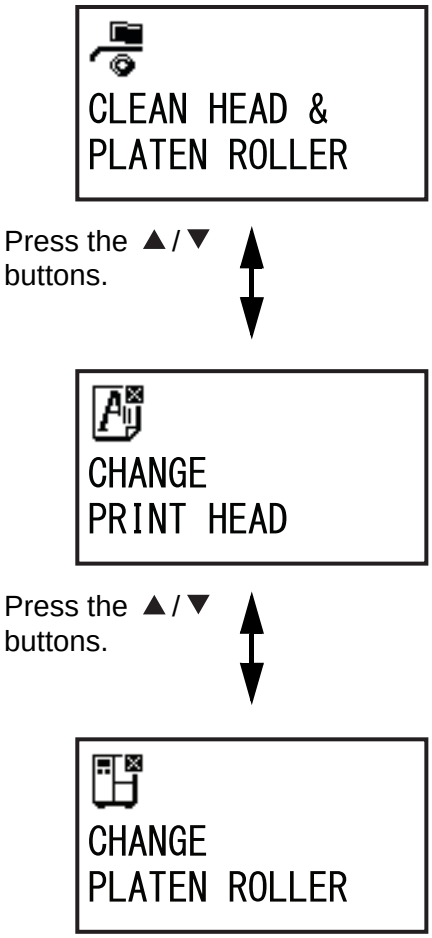
This section shows the media motion when the set notification interval has been reached.
You can set the notification function in the **NOTIFICATION FUNCTION SETTING** screen of the user mode menu.



- The counter is cleared by pressing the ↵ **ENTER** button while the warning message is shown. (Start counting from 0 again.)
- When resuming printing without pressing the ↵ **ENTER** button, the printer enters the offline mode and the counter is not cleared. (The warning is shown again while in standby mode.)
- When the ▶|| **LINE** button is pressed, the printer enters online or offline mode from the warning screen. The same goes for other buttons, entering each screen.

When multiple notifications occur at the same time

The warning screen can be changed by pressing the ▲/▼ buttons.
To release the warning, press the ↵ **ENTER** button at each screen.
When the warning is released by pressing the ↵ **ENTER** button, the warning screen is deleted and the printer goes to the next screen.



8.7 Replacing Consumable Parts

Some consumable parts, such as the print head and platen roller, will wear out over time and can be replaced easily. This section describes the procedures to replace these parts.

Note

- Use only SATO genuine consumable parts for replacement.
  Contact your SATO reseller or technical support center for parts ordering information.
- Regular cleaning may extend the life span of some print heads and platen rollers. Refer to **Section 6.2 Maintenance of the Print Head and Platen Roller** for details.

8.7.1 Replacing the Print Head

You can easily remove and replace a damaged or worn print head.

Before replacement

Perform a factory test print and check the head counter.

⚠ WARNING

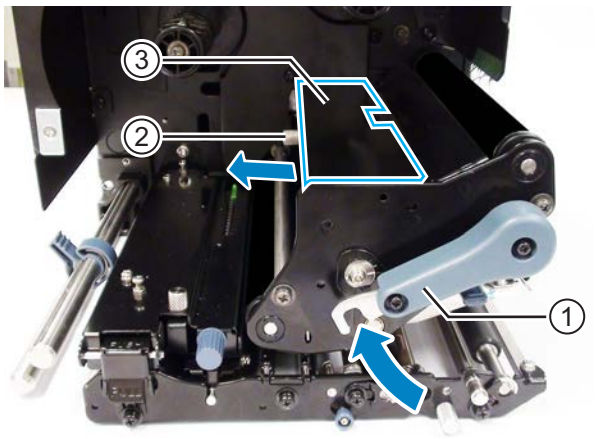
- Do not touch the power switch, connect or disconnect the power cord while your hands are wet. Doing so could cause an electric shock.
- Disconnect the power cord from the AC outlet before you replace the print head.
- Wear gloves before replacing the print head, to prevent damage to the print head.

1. Make sure that the printer is in power off mode, then disconnect the power cord from the AC outlet.
2. Open the top cover.

⚠ CAUTION

Open the top cover fully to prevent accidental drop of the cover.

3 Turn the **head lock lever** ① clockwise to unlock the **print head**.



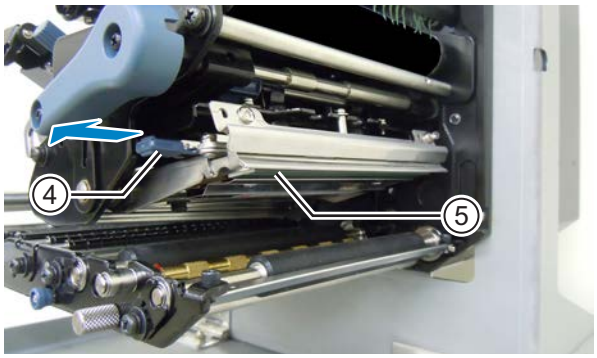
CAUTION

- The print head and its surroundings are hot after printing. Be careful not to touch it, to avoid being burned.
- Touching the edge of the print head with your bare hand could cause injury.

4 Remove the **thumbscrew** ② attached to the **cover** ③ on top of the **print head assembly**. Remove the **cover** ③ and place it aside.

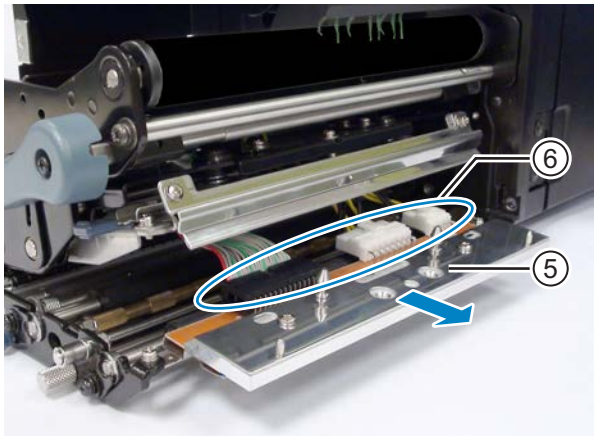
5 Pull the **tab** ④ to remove the **print head** ⑤.

Support the print head with your hand when the **print head** is released.



6 Pull out the **print head** ⑤ and remove all the **connectors** ⑥ from the defective **print head** ⑤.

7 Connect the **connectors** to the new **print head**.

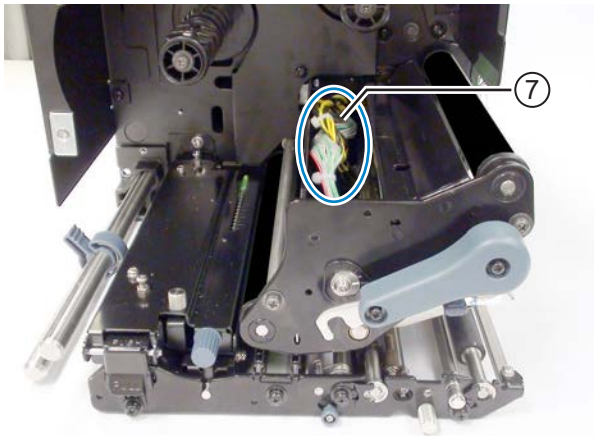


8 Pull back and arrange the **cables** ⑦ from the top of the **print head assembly**.

9 Install the **print head** to the print head assembly.

Align the print head and press the print head upward until it is latched.

10 Attach the **cover** ③ back to the top of the **print head assembly** with the **thumbscrew** ②.



⚠ CAUTION

When attaching the cover, be careful not to pinch the wire.

After replacement

- Set the print head selection. (Only for S86-ex printer with the firmware version later than 61.00.00.06.) In SERVICE MODE, press the ↵ **ENTER** button repeatedly until the **HEAD SELECT** screen is shown. Select the options according to the first fourteen to fifteen characters of the print head serial number and then press the ↵ **ENTER** button.
- Adjust the print darkness.
- Make sure that the print head opens and closes without difficulties.

8.7.2 Replacing the Platen Roller

You can easily remove and replace a damaged or worn platen roller.

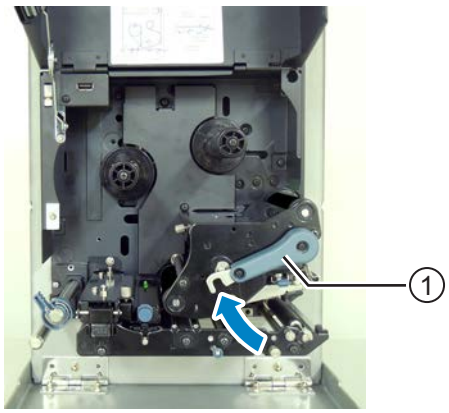
1 Make sure that the printer is in power off mode, then disconnect the power cord from the AC outlet.

2 Open the top cover.

⚠ CAUTION

Open the top cover fully to prevent accidental drop of the cover.

3 Turn the **head lock lever** ① clockwise to unlock the **print head**.



CAUTION

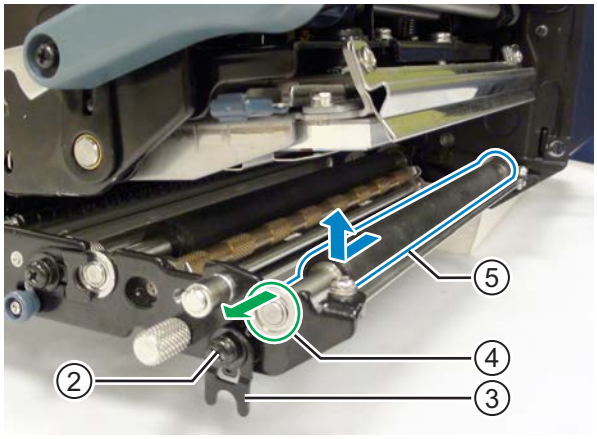
- The print head and its surroundings are hot after printing. Be careful not to touch it, to avoid being burned.
- Touching the edge of the print head with your bare hand could cause injury.

4 Loosen the **screw** ② until the **bearing clamp** ③ is released.

Do not remove the screw.

5 Remove the **bearing** ④ from the chassis and the shaft of the **platen roller** ⑤.

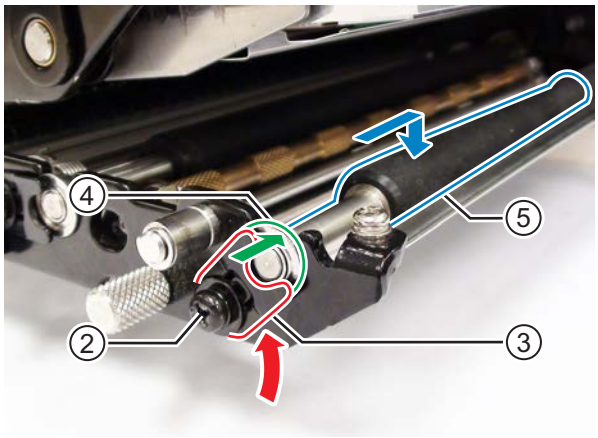
6 Pull out the **platen roller** ⑤ from the printer and replace it with a new **platen roller**.



7 Insert the gear end of the **platen roller** ⑤ fully into the printer's center frame.

8 Place the **bearing** ④ back to the chassis and the shaft of the **platen roller**.

9 Rotate the **bearing clamp** ③ onto the **bearing** ④ and attach it with the **screw** ②.



After replacement

- Adjust the print darkness.

8.7.3 Replacing the Pressure Roller

You can easily remove and replace a damaged or worn pressure roller.

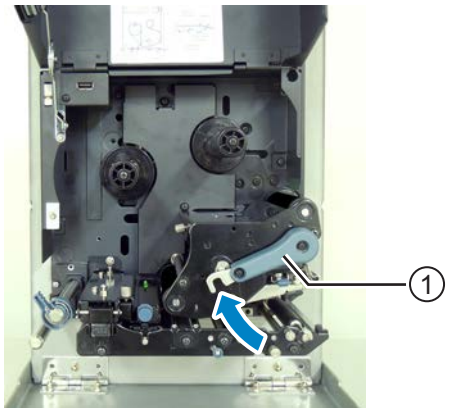
1 Make sure that the printer is in power off mode, then disconnect the power cord from the AC outlet.

2 Open the top cover.

⚠ CAUTION

Open the top cover fully to prevent accidental drop of the cover.

3 Turn the **head lock lever** ① clockwise to unlock the **print head**.



⚠ CAUTION

- The print head and its surroundings are hot after printing. Be careful not to touch it, to avoid being burned.
- Touching the edge of the print head with your bare hand could cause injury.

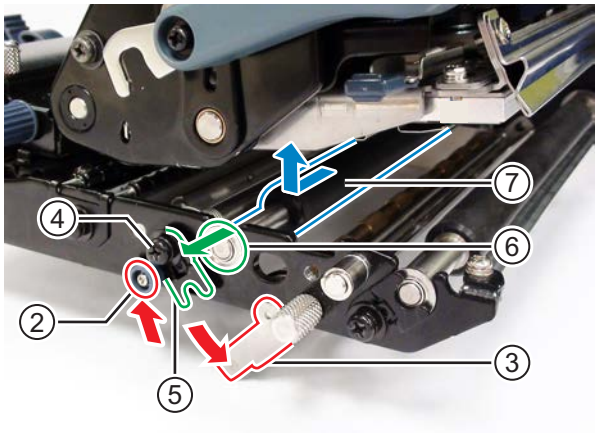
4 Push the **pressure roller release tab** ② up to release the **pressure roller plate** ③.

5 Loosen the **screw** ④ until the **bearing clamp** ⑤ is released.

Do not remove the screw.

6 Remove the **bearing** ⑥ from the chassis and the shaft of the **pressure roller** ⑦.

7 Pull out the **pressure roller** ⑦ from the printer and replace it with a new **pressure roller**.

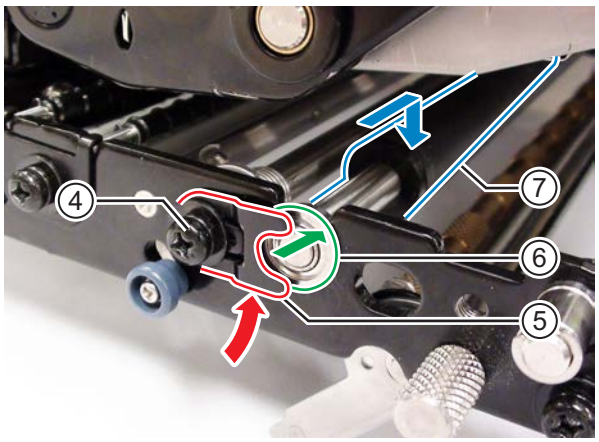


8 Insert the gear end of the **pressure roller** ⑦ fully into the printer's center frame.

9 Place the **bearing** ⑥ back to the chassis and the shaft of the **pressure roller**.

10 Rotate the **bearing clamp** ⑤ onto the **bearing** ⑥ and attach it with the **screw** ④.

11 Push the center of the **pressure roller plate** to latch it in place.



8.7.4 Replacing the Media Feed Roller

You can easily remove and replace a damaged or worn media feed roller.

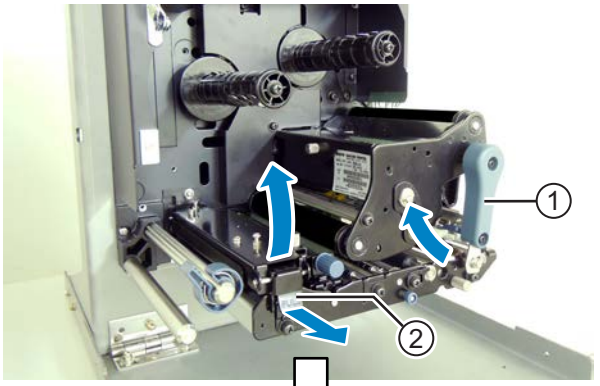
1 Make sure that the printer is in power off mode, then disconnect the power cord from the AC outlet.

2 Open the top cover.

⚠ CAUTION

Open the top cover fully to prevent accidental drop of the cover.

3 Turn the **head lock lever** ① clockwise to unlock the **print head**.

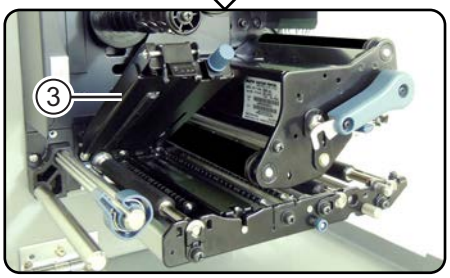


⚠ CAUTION

- The print head and its surroundings are hot after printing. Be careful not to touch it, to avoid being burned.
- Touching the edge of the print head with your bare hand could cause injury.

4 Pull the **feed lock latch** ② to unlock the **feed roller and media sensor assembly** ③.

The feed roller and media sensor assembly will flip open.

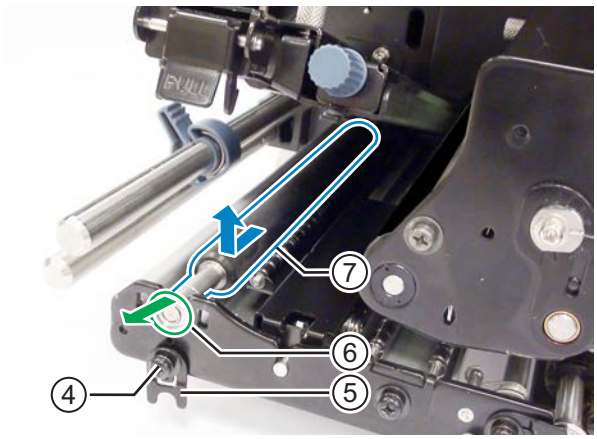


5 Loosen the **screw** ④ until the **bearing clamp** ⑤ is released.

Do not remove the screw.

6 Remove the **bearing** ⑥ from the chassis and the shaft of the **media feed roller** ⑦.

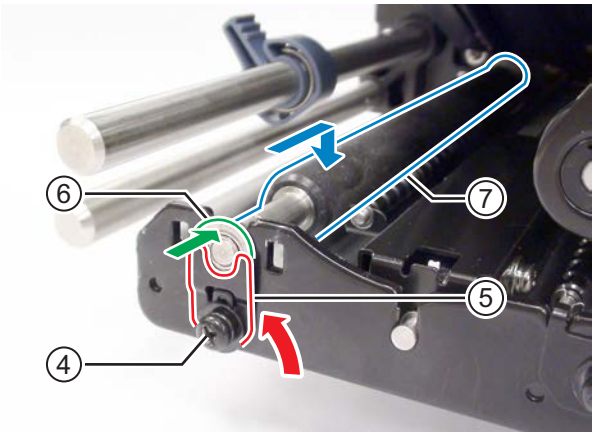
7 Pull out the **media feed roller** ⑦ from the printer and replace it with a new **media feed roller**.



8 Insert the gear end of the new **media feed roller** ⑦ fully into the printer's center frame.

9 Place the **bearing** ⑥ back to the chassis and the shaft of the **media feed roller**.

10 Rotate the **bearing clamp** ⑤ onto the **bearing** ⑥ and attach it with the **screw** ④.



8.7.5 Replacing the Fan Filter

The fan filter prevents atmospheric debris from being drawn into the printer.

1 Peel off the old **fan filter** ① from the rear of the printer.

2 Clean the printer to remove any adhesive residue on the surface.

Note

You can purchase a cleaning kit from a SATO reseller or technical service center.

3 Remove the backing paper from the new **fan filter** ① and paste the **fan filter** ① over the fan exhaust holes.



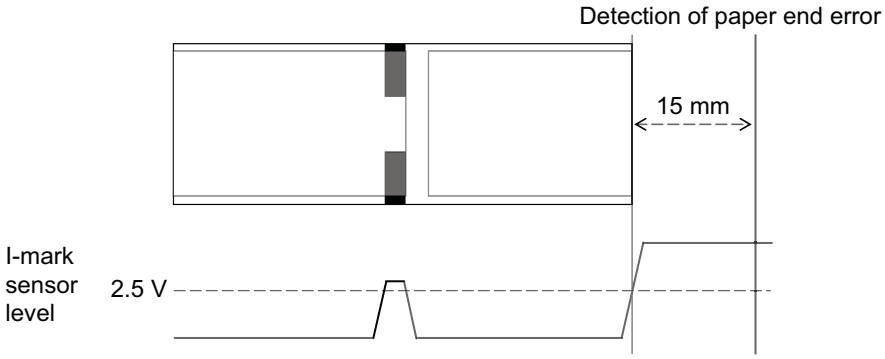
8.8 Media Motion of the Printer Operation

8.8.1 Feed Motion

When the pitch sensor is disabled, media will be fed while pressing the **FEED** button.
When the pitch sensor is enabled, one media will be fed according to the backfeed motion setting.

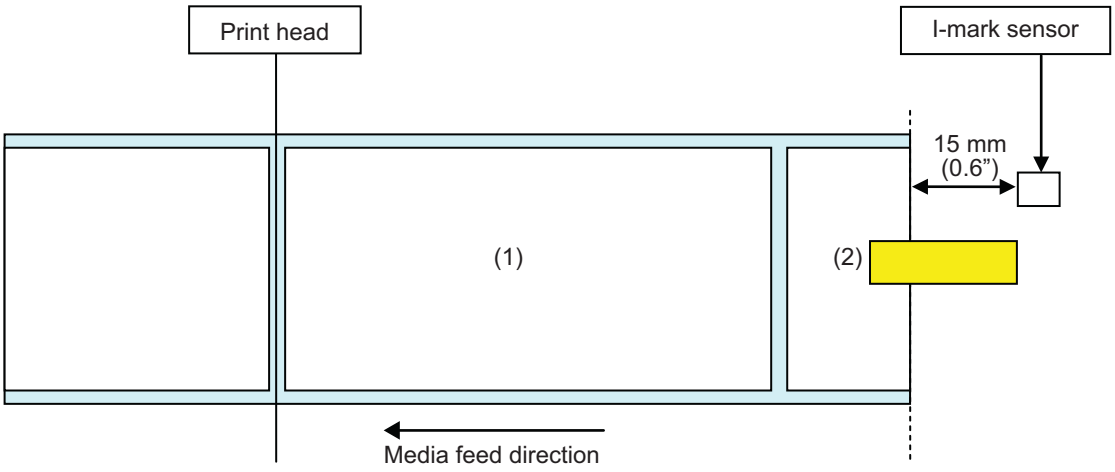
8.8.2 Paper End

When the I-mark sensor level has changed to high for 15 mm (0.6”), it will be considered as the paper end.



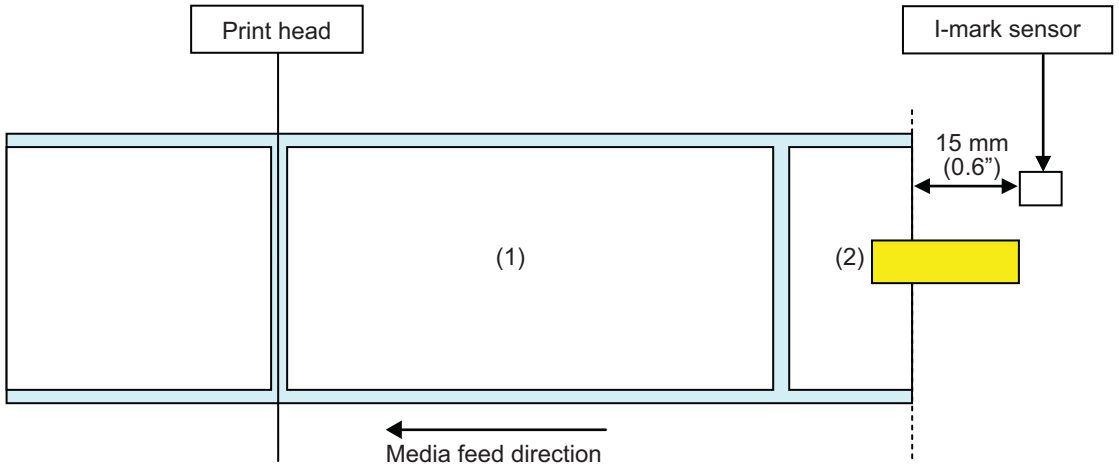
Paper End Detection in Feed Operation

After the paper end is detected, the printer stops the feed operation immediately and generates an error.

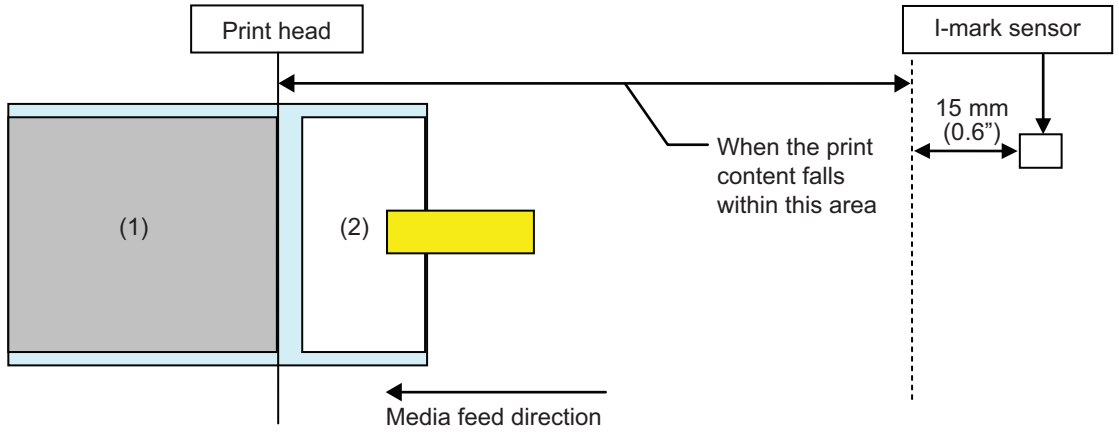


Paper End Detection in Print Motion

Operation varies by the number of remaining print steps when the paper end occurs during print operation.

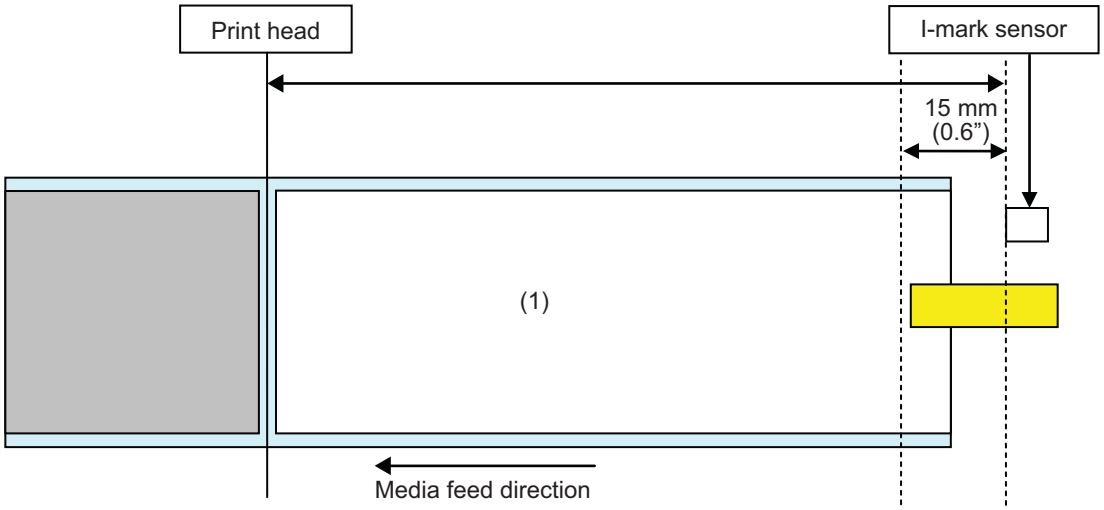


[When the print content falls within the area from the print head position to 15 mm (0.6") less than the I-mark sensor.]



- After completing the print of media (1), "Paper end error" will occur.
- After releasing the error, media (1) will not be printed again.

[When the media pitch size is between the print head position and the I-mark sensor and is more than 15 mm (0.6”).]



- “Paper end error” will occur while printing the media (1), right after detecting “paper end”.
- If an error occurs while printing, media (1) will be printed again after releasing the error. If the print job is completed at the time an error occurs, media (1) will not be printed again.

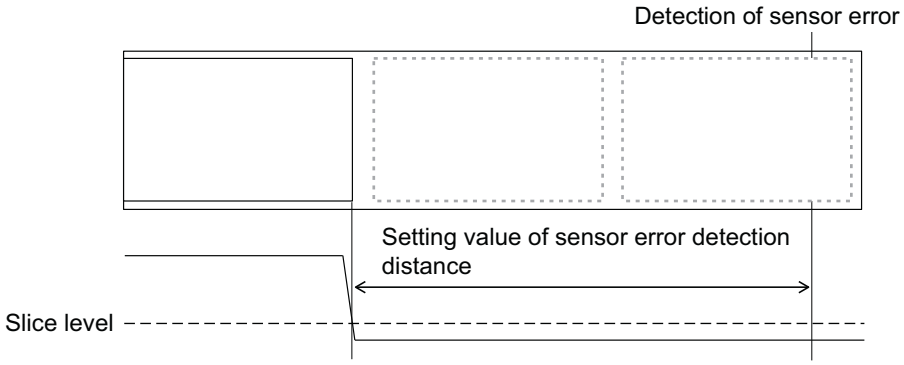
8.8.3 Sensor Error

Detection of a sensor error is performed by the gap sensor or the I-mark sensor when the pitch sensor is enabled, and the detection distance of the sensor error varies depending on the condition such as the type of sensor.

Detection method for each sensor type

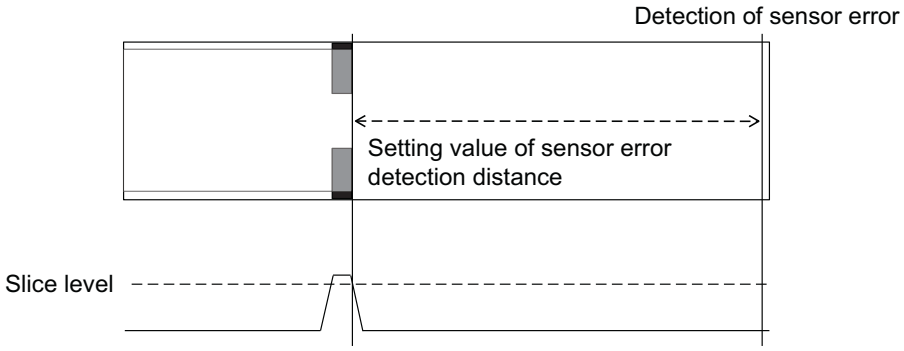
Gap Sensor

When using the Gap sensor:



I-mark Sensor

When using the I-mark sensor:



Distance to detect the sensor error

Detection distance of sensor error is determined by the head density and the vertical print area. In addition, it varies by the setting of the maximum media length.

1) Detection distance of sensor error by the vertical print area

Head density	Vertical print area after editing		
	V > 1250 mm	1250 mm ≥ V > 510 mm	510 mm ≥ V
8 dots/mm (203 dpi)	2510 mm	1250 mm	510 mm
12 dots/mm (305 dpi)	1510 mm	1250 mm	510 mm
24 dots/mm (609 dpi)	1250 mm	1250 mm	510 mm

2) Detection distance of sensor error according to the maximum media length (MEDIA LENGTH) setting

The detection distance setting of the sensor error according to the maximum media length is only available when using the gap sensor.

Distance between the head position and the gap sensor > Maximum media length > 24 mm

Detection distance of the sensor error = Maximum media length -6 mm

8.8.4 Ribbon Error

Ribbon end detection

The ribbon sensor on the ribbon supply side and the ribbon sensor on the ribbon rewind side detect the ribbon end error. The ribbon end error occurs when one of the ribbon sensor detects the ribbon end.

1) Detection by the ribbon sensor on the supply side.

While feeding the media, when the ribbon on the ribbon supply side has not rotated for 32 mm (1.26”) or more, the ribbon sensor will detect the ribbon end error.

2) Detection by the ribbon sensor on the rewind side.

While feeding the media, when the ribbon on the ribbon rewind side has not rotated for 80 mm (3.15”) or more, the ribbon sensor will detect the ribbon end error.

Following are the behaviors when detecting the ribbon end according to the remaining print job.

- When the remaining printing is 12 mm or more, the printer generates a ribbon error immediately after detection.
- When the remaining printing is less than 12 mm, the printer generates a ribbon error after printing is completed.

Ribbon near end detection

The ribbon near end is detected by the ribbon sensor on the supply side. This occurs when the remaining ribbon length becomes less than approximately 15 m, 49.2 ft. (ribbon diameter is approximately 36 mm, 1.4”).
Note that the remaining ribbon length (15 m, 49.2 ft.) is a calculated value from the revolution speed of the ribbon on the supply side. The timing of the ribbon end varies according to the reading condition of the ribbon sensor and the ribbon thickness.

8.9 Print Speed and Media Size

The minimum media pitch size varies by the print speed setting.

Print speed (inches/sec)	Continuous mode	Dispenser mode	
	Minimum media pitch size (mm)	(Thermal transfer) Minimum media pitch size (mm)	(Direct thermal) Minimum media pitch size (mm)
2	9	13	18
3	9	13	18
4	9	13	18
5	11	13	18
6	13	13	18
7	15	13	18
8	17	13	18
9	20	13	18
10	23	13	18
11	27	13	18
12	31	16	18
13	35	20	20
14	40	25	25
15	44	29	29
16	50	35	35

Note

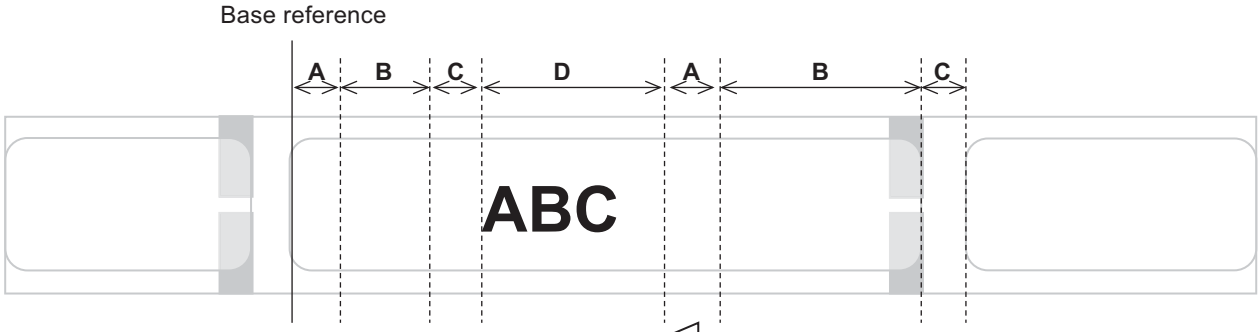
- If using media smaller than the minimum size, the media will not stop at the right position, causing a print misalignment.
- Do not send the print data with media size that is smaller than the minimum media pitch size, even when the sensor is disabled.
- The above minimum media pitch sizes are valid only when the print position adjustment and offset adjustment are set to 0 mm. The minimum media pitch size changes when the print position adjustment and offset adjustment are set to the value other than 0 mm.

8.10 Optional Ribbon Saver

Ribbon saver is a function to save on ribbon consumption by moving the print head up and down. This optional function is only available for the S84-ex thermal transfer printer if the ribbon saver kit is installed.

8.10.1 Ribbon Saver Operation

The figure below shows the print head position when printing with the ribbon saver function activated.

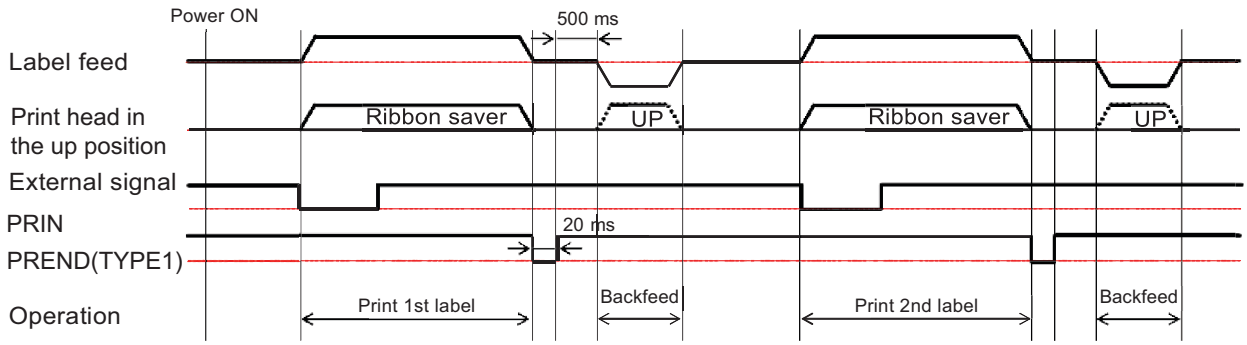


A : Print head is moving upward.
B : Print head is in the up position.
C : Print head is moving downward.
D : Print head is in the down position. Printing mode.

- Ribbon saver function works when:
  - You have selected TRANSFER in the ADVANCED MODE>**PRINT METHOD** setting screen.
  - You have selected ENABLE in the ADVANCED MODE>**RIBBON SAVER** setting screen.
- Be sure to use dispenser mode when using the ribbon saver function. The label is not fed normally when the dispenser is not used.
- The print head is not lifted up during label feeding operation (Forward feed).
- The print head will be in the down position every time the printer is printing. (Start printing immediately to avoid decreasing the processing power and preventing the label from moving during pause.)
- The print head will be in the down position when a printing error occurs.
- The accuracy of printing is ± 1.5 mm when the ribbon saver function is enabled.
- Power off the printer when an error occurs on the ribbon saver to avoid abnormal printing.
- Scuffing may occur depending on the combination of the ribbon and label used. Verify the combination before use and select an appropriate ribbon.
- When requiring two labels for one print data, the ribbon saver function will not work on the second label.
- When the printer is powered on, the print head will move to the reference position (down position).
- Saver error message is shown on the screen when the print head cannot move to the reference position.

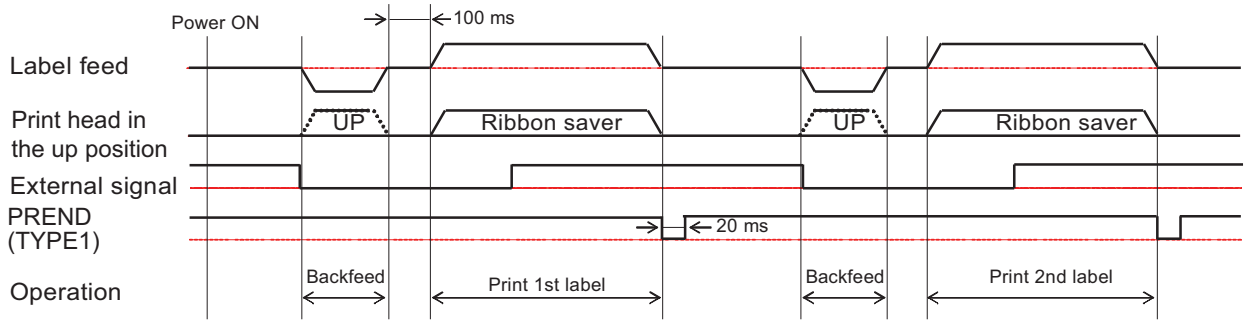
8.10.2 Ribbon Saver Timing Charts

Dispenser mode, backfeed after print and pulse input



- Normally the print head is in the down position during backfeed. However, the print head will be lifted up when the ribbon print position is not identified.

Dispenser mode, backfeed before print and pulse input

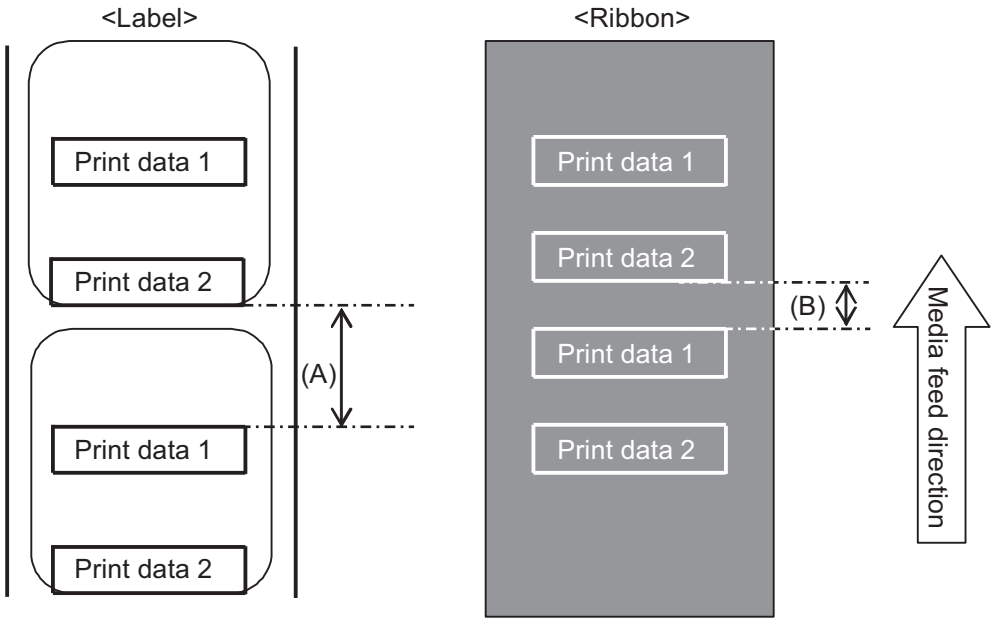


- Normally the print head is in the down position during backfeed. However, the print head will be lifted up when the ribbon print position is not identified.

8.10.3 Ribbon Saver Operation and Ribbon Consumption

When a gap exists in front of the label

The figure and table below show the minimum distance (A) from the top of the label to the print start position for each print speed required for the ribbon saver function. It also shows the consumption of the ribbon (B) when the ribbon saver is operating.



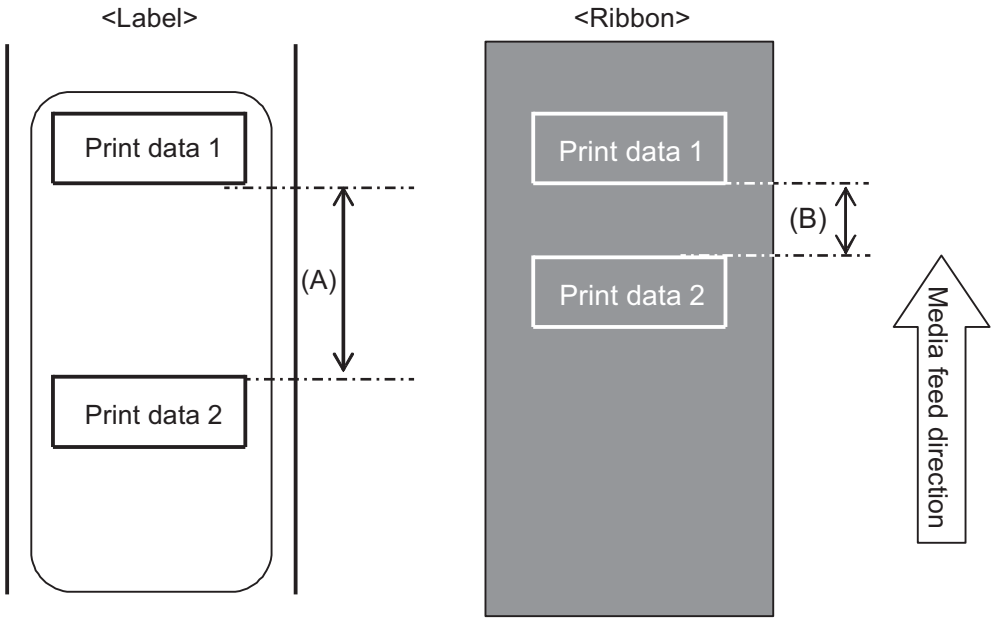
(unit: mm)

Print speed (inches/sec)	Distance (A)	Ribbon consumption (B)
2	11.0	6.5
3	12.0	7.5
4	13.0	8.8
5	14.0	9.9
6	16.0	10.5
7	16.0	11.0
8	18.0	11.5
9	19.0	12.0
10	21.0	12.5
11	22.0	13.0
12	24.0	13.5
13	26.0	14.5
14	27.0	15.0
15	29.0	16.0
16	31.0	16.5

The ribbon consumption might be different from the value in the above table depending on the ribbon condition.

When a gap exists in the print data

The figure and table below show the minimum distance (A) required from the end of printing to the next print start position. It also shows the consumption of the ribbon (B) when the ribbon saver is operating.



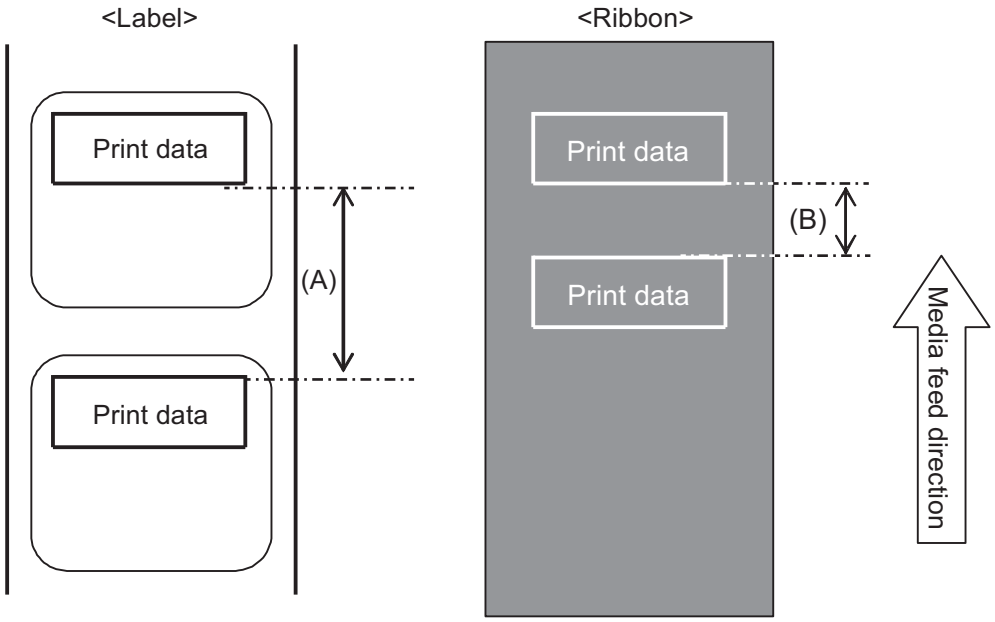
(unit: mm)

Print speed (inches/sec)	Distance (A)	Ribbon consumption (B)
2	11.0	9.5
3	12.0	10.0
4	13.0	10.5
5	14.0	11.0
6	16.0	12.0
7	16.0	13.5
8	18.0	15.0
9	19.0	15.0
10	21.0	15.5
11	22.0	16.0
12	24.0	17.5
13	26.0	19.0
14	27.0	20.0
15	29.0	22.0
16	31.0	26.0

The ribbon consumption might be different from the value in the above table depending on the ribbon condition.

When a gap exists in the back of the label

The figure and table below show the distance (A) from the end of printing to the next print start position with backfeed for printing. It also shows the consumption of the ribbon (B) when the ribbon saver is operating.



Condition

(1) Print operation Backfeed
(2) Setting Dispense distance 14 mm (0.55”)
PITCH and OFFSET of OFFSET VOLUME should be set to 0.00,
PITCH OFFSET should be set to 0.
(3) Print position Vertical print position is V001.

(unit: mm)

Print speed (inches/sec)	Distance (A)	Ribbon consumption (B)
2	4.0	2.5
3	4.0	2.5
4	4.0	2.5
5	4.0	2.5
6	4.0	2.5
7	4.0	2.5
8	4.0	2.5
9	4.0	3.0
10	4.0	3.0
11	4.0	3.5
12	6.0	3.5
13	8.0	5.5
14	9.0	7.5
15	11.0	9.0
16	13.0	11.0

The ribbon consumption might be different from the value in the above table depending on the ribbon condition.

8.10.4 Ribbon Specification for the Ribbon Saver

Ribbon width	39.5 mm or more

Ribbon length	Guaranteed operation speed of ribbon saver
Up to 300 m roll (Under 69 mm in diameter)	2 to 12 inches (more than 15 mm of printing)
Up to 500 m roll (Under 82 mm in diameter)	2 to 12 inches (more than 20 mm of printing)
Up to 600 m roll (Under 108 mm in diameter)	2 to 6 inches (more than 30 mm of printing)

- Be sure to remove the used ribbon at the rewinder side and replace the paper core with a new one when using up one roll of ribbon.
- Be sure to perform the preliminary operation check because the lengths of ribbon mentioned above are calculated from mechanical structure and have a limitation according to the type of ribbon, operating environment and usage.

8.10.5 Label Specification for the Ribbon Saver

Label width		30 mm or more
Label pitch	Backfeed	25 mm or more
	No backfeed	60 mm or more

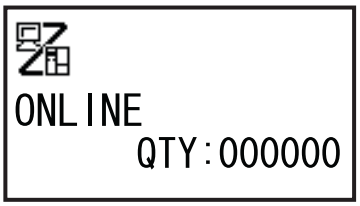
8.11 Optional UHF RFID Configuration

This section provides more information on the RFID operations.

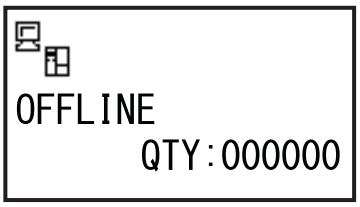
1 Examine the media to determine the printer settings.

Refer to the **S84ex UHF Inlay Configuration Guide** for the measurements you should take and what they mean, as well as a list of inlays and their required configurations.

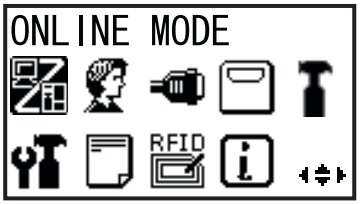
2 Press the power switch on the operator panel to “I” position.



3 When the printer is in online mode, press the ⏯ LINE button on the operator panel to change to offline mode.

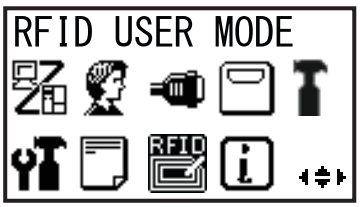


4 Press the ↵ ENTER button to show the **setting mode** menu.



5 Press the ▲/▼/◀/▶ buttons to select **RFID USER MODE** and then press the ↵ ENTER button.

The RFID USER MODE screen shows.



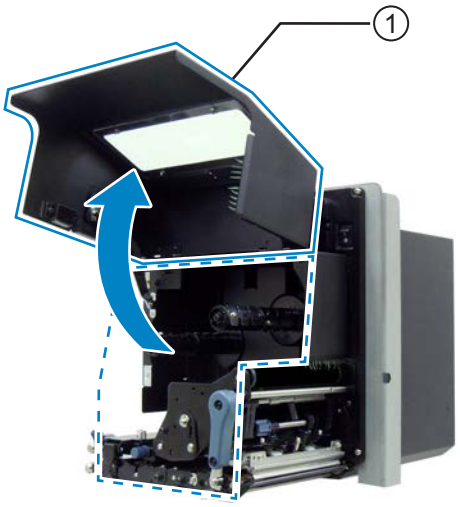
6 Press the ▲/▼/◀/▶ buttons to select the item or set the value accordingly. The active arrow icons are shown on the screen.

Refer to **Section 4.2.15 RFID User Mode** for details on the configuration items.

7 Open the **top cover** ①.

⚠ CAUTION

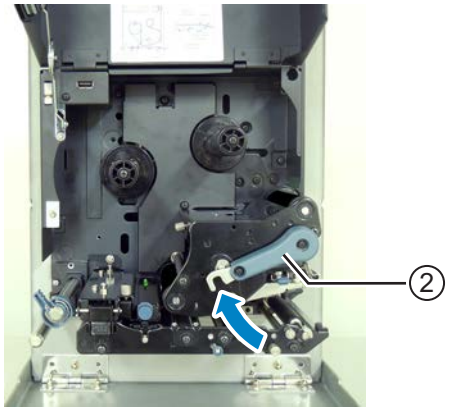
Open the top cover fully to prevent accidental drop of the cover.



8 Turn the **head lock lever** ② clockwise to unlock the print head.

⚠ CAUTION

- The print head and its surroundings are hot after printing. Be careful not to touch it, to avoid being burned.
- Touching the edge of the print head with your bare hand could cause injury.



9 Load the media and ribbon.

Refer to **Section 3.2 Loading the Ribbon** and **Section 3.5 Loading Media** for details.

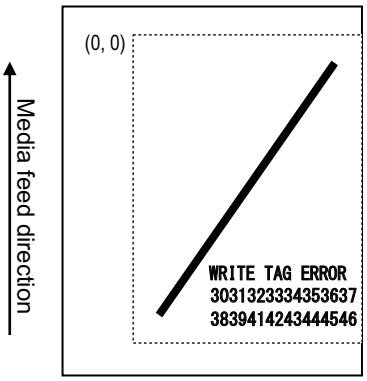
10 Confirm the operation by printing/ encoding a media.

Make sure that you read the data and check that it is correctly encoded.

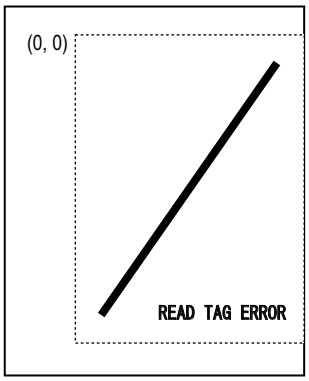
8.11.1 Printing RFID Tag Errors

If the recorded data on a tag is incomplete due to writing on a defective tag, the printer will print an RFID tag error to the defective media. This function is to prevent the distribution of defective media with a tag error.
When an RFID tag error occurs, the printer prints a slash and the error message, such as “WRITE TAG ERROR” or “TAG NOT FOUND”. When the error is related to the writing error, the printer continue to print the first sixteen bytes of write data.
With the label size that is smaller than width 45 mm, pitch 35 mm, the write data is not printed. And with the label size that is smaller than width 40 mm, pitch 30 mm, only slash is printed. (When the tag offset is set to other than the default, add the value of tag offset to the pitch length.)
The diagram below shows the message printed on the position based on the media size specified by the normal print command <A1>.

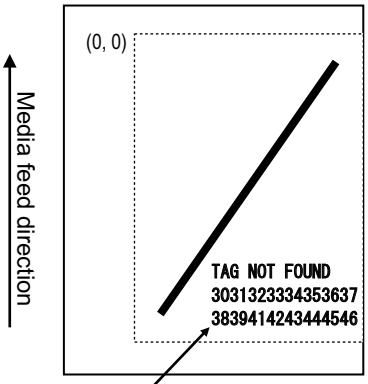
WRITE TAG ERROR in RFID write command



READ TAG ERROR in tag data print command <TU>

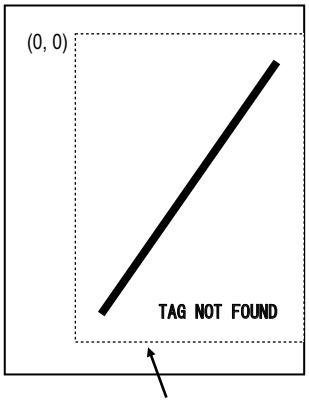


TAG NOT FOUND error in RFID write command



Dump data in HEX for the first sixteen bytes of the write data, or the maximum thirty two characters in ASCII.
The dump data will be in HEX when non-printable characters and control characters are included in the data.

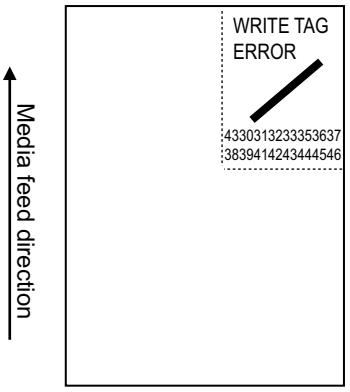
TAG NOT FOUND error in tag data print command <TU> (INVENTORY CHECK is enabled)



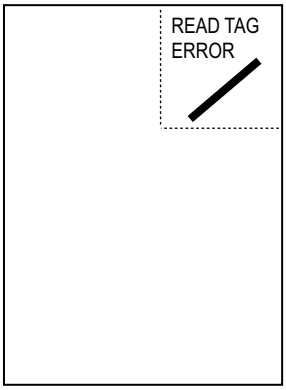
* Dotted line shows the range specified with media size command <A1>.
* (0,0): The origin of the range specified by the media size command <A1>

When the data is consisted with all printable characters, the dump data will be a maximum of thirty-two characters in ASCII. When there is a non-printable character or a control code that are non-printable, the dump data will be a maximum of sixteen bytes in HEX. Sixteen bits character codes, such as Kanji, are not supported.
When the media size is not specified with the <A1> command, the error message and slash are printed in a small layout as shown below, since the origin to be referenced is not clear.

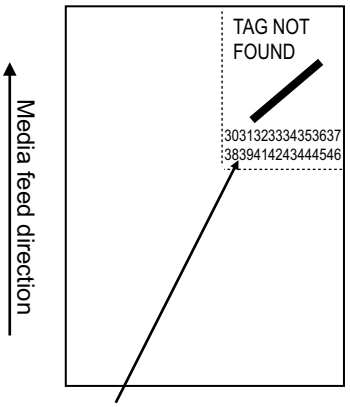
WRITE TAG ERROR in RFID write command



READ TAG ERROR in tag data print command <TU>

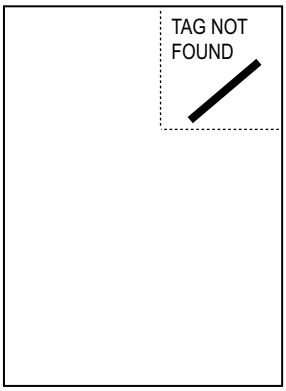


TAG NOT FOUND error in RFID write command



Dump data in HEX for the first sixteen bytes of the write data, or the maximum thirty two characters in ASCII.
The dump data will be in HEX when non-printable characters and control characters are included in the data.

TAG NOT FOUND error in tag data print command <TU> (INVENTORY CHECK is enabled)

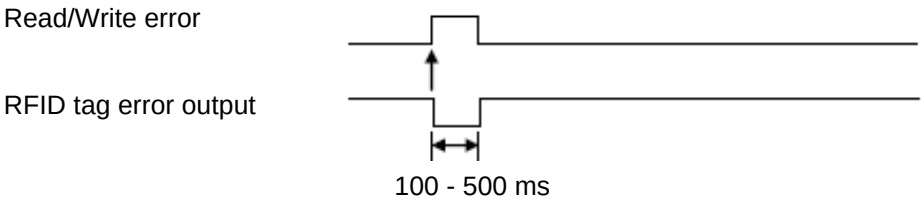


The types of errors to print are as follows:

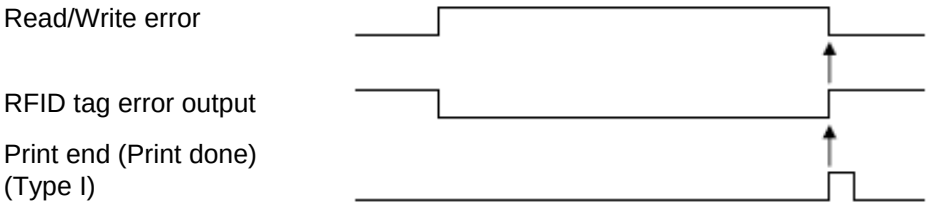
Message	Cause and Countermeasure	
TAG NOT FOUND	Cause	Did not find the tag to print, or failed to read the tag.
	Countermeasure	Confirm the inlay operation and check the printer/antenna configuration.
WRITE TAG ERROR	Cause	Failed to write the tag.
	Countermeasure	Confirm the inlay operation and check the printer/antenna configuration.
VERIFY ERROR	Cause	The written value and the read value do not match.
	Countermeasure	Confirm the inlay operation and check the printer/antenna configuration.
LOCKING ERROR	Cause	Failed to lock the tag.
	Countermeasure	Check the media.
MULTI TAGS ERROR	Cause	Multiple tags captured at a time.
	Countermeasure	Confirm the inlay operation and check the printer/antenna configuration.
CHIP MAKER ERR.	Cause	Specified tag chip manufacturer is not correct when specifying in MCS setting and encoding SGTIN96.
	Countermeasure	Check the media, and correct the tag chip manufacturer.
MCS NOT SUPPORT	Cause	Unsupported inlay (IC chip) is used when specifying the MCS setting and encoding SGTIN96.
	Countermeasure	Check the media, and change it with supported inlay.
READ ONLY ERROR	Cause	Succeeded to read but failed to write the tag.
	Countermeasure	Confirm the inlay operation and check the printer/antenna configuration.

8.11.2 RFID Error and Reset Timing

Error signal output with one-shot pulse

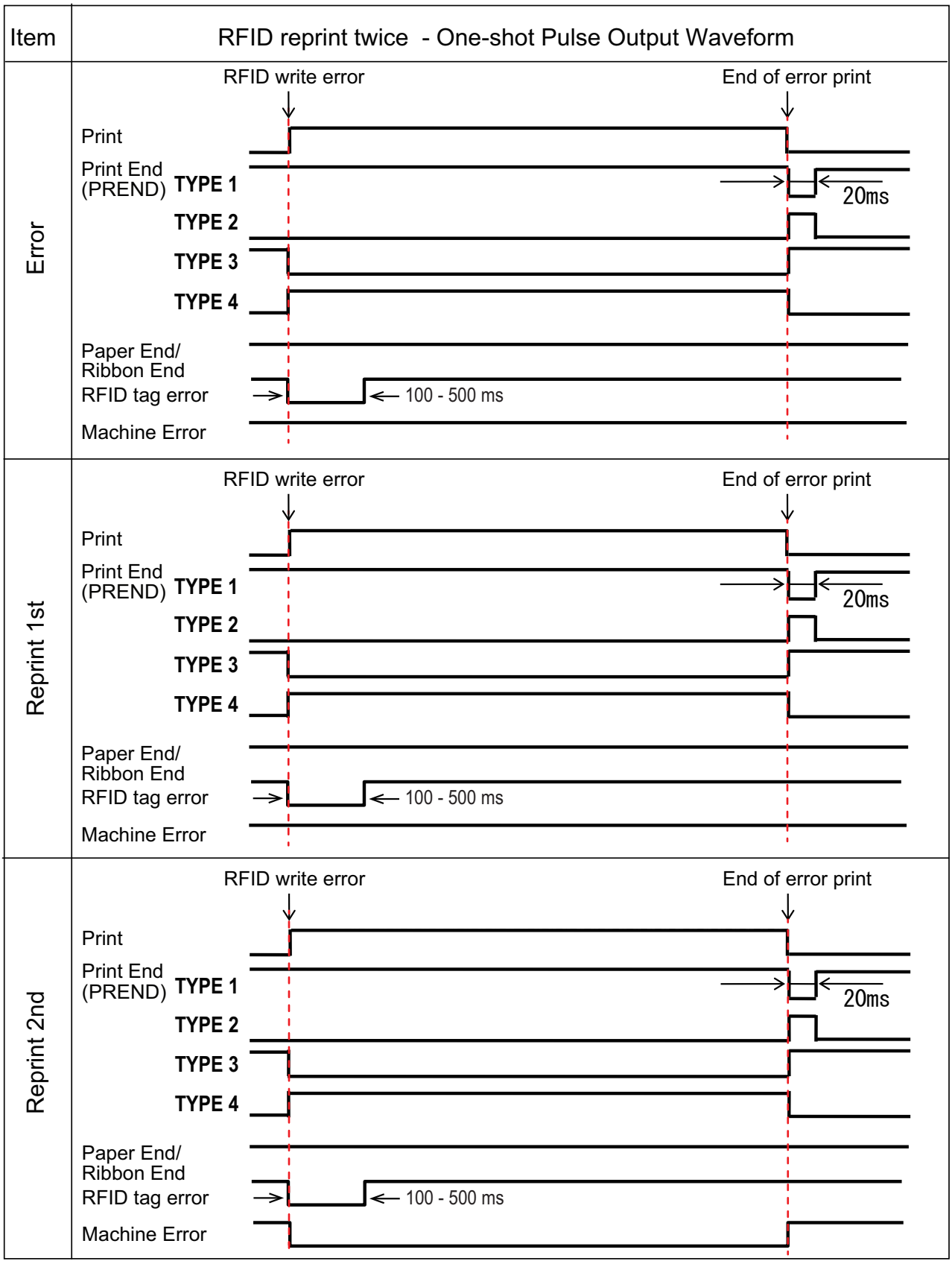


Error signal output with long pulse

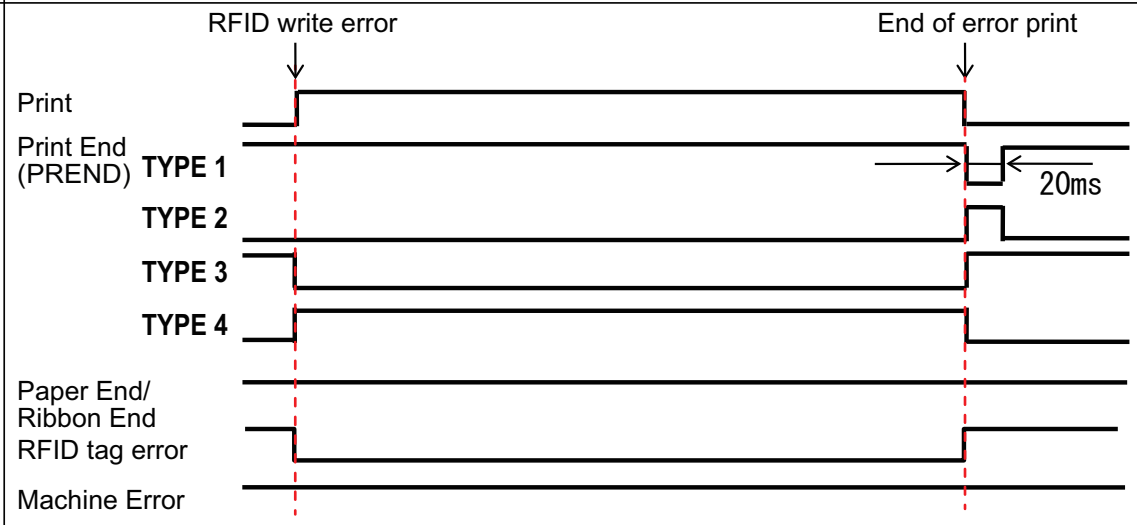
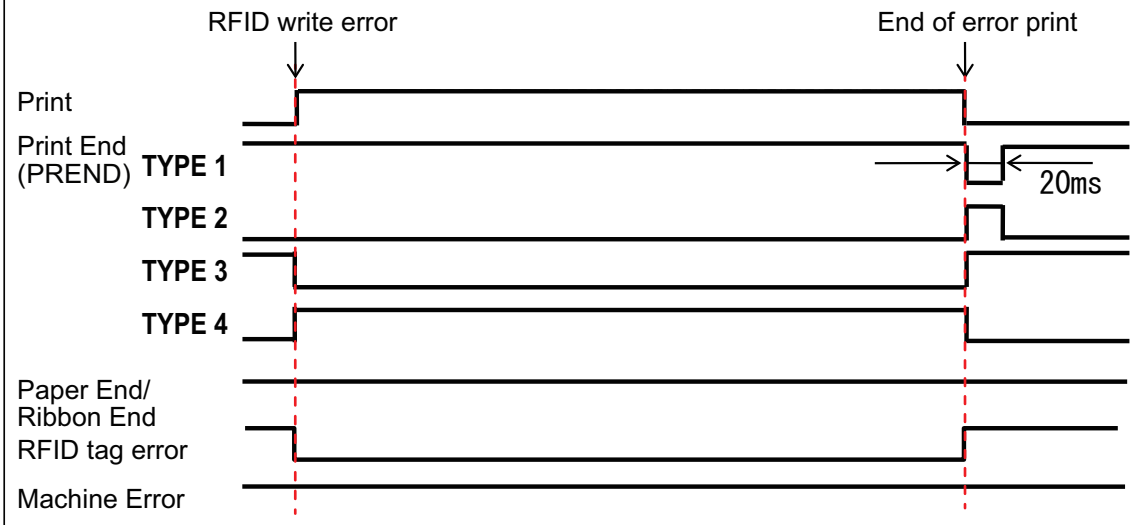
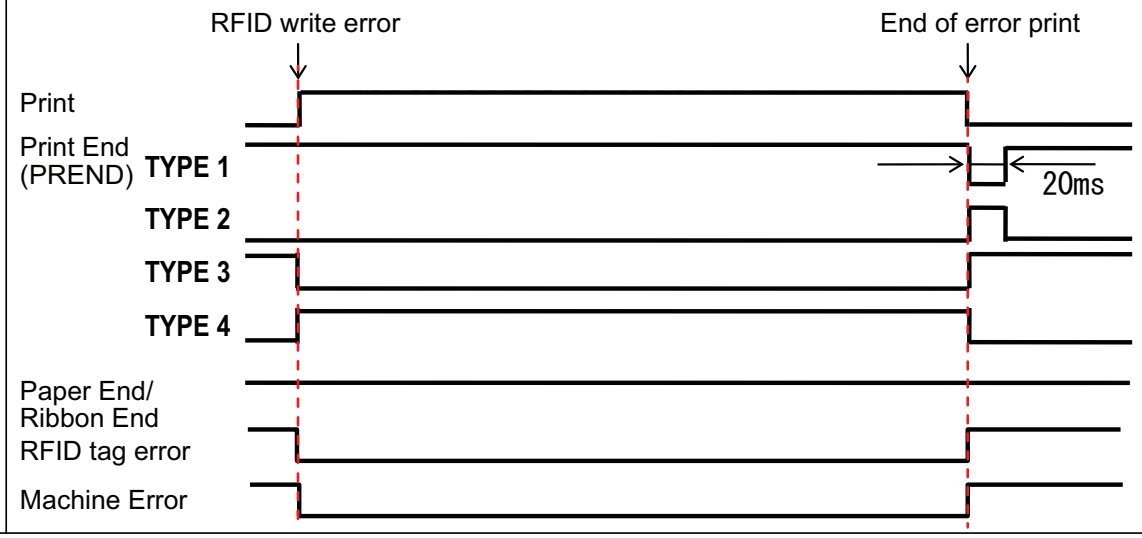


When the reprint count reaches the specified number, the RFID tag error and Machine error are output at a time. The machine error output is always a long pulse.

Timing chart of error signal output with one-shot pulse



Timing chart of error signal output with long pulse

Item	RFID reprint twice - Level Output Waveform
Error	
Reprint 1st	
Reprint 2nd	

8.11.3 External (EXT) Signal Interfaces when RFID Module is Enabled

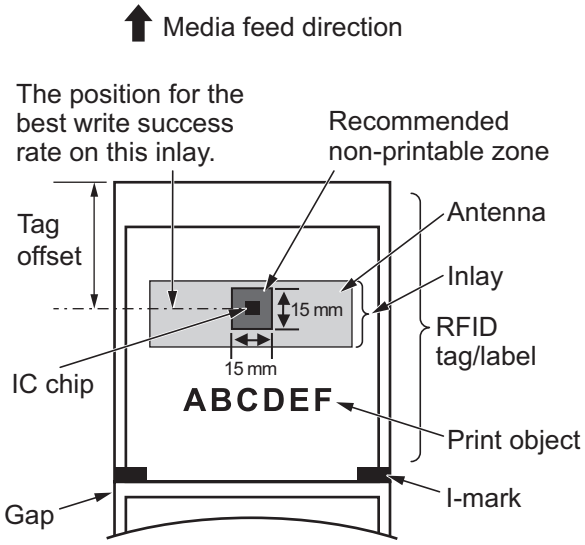
Standard specification is applied when the RFID module is set to DISABLE. Functions shown by shading are applied when the RFID module is set to ENABLE.

Pin No.		Signal Name		Input/ Output
(25 pins)	(14 pins)	Standard Specification RFID Module Disabled	RFID Module Enabled	
1	14	Frame Ground	Frame Ground	-
2	-	+5 V	+5 V	-
3	-	-	-	-
4	4	Machine Error	Machine Error/RFID Error	Output
5	6	Print end signal (PREND)	Print end signal (PREND)	Output
6	9	Online	Online	Output
7	-	Label Near End	Label Near End	Input
8	7	Reprint signal (PRIN2)	Reprint signal (PRIN2)	Input
9	-	-	-	-
10	-	-	-	-
11	-	OUT_COM	OUT_COM	-
12	13	+5 V	+5 V	-
13	12	+24 V	+24 V	-
14	2	GND	GND	-
15	2	OUT_COM	OUT_COM	-
16	3	Ribbon End	RFID Tag Error	Output
17	1	Paper End	Paper End + Ribbon End	Output
18	10	Ribbon Near End	Ribbon Near End	Output
19	-	-	-	-
20	5	Print start signal (PRIN)	Print start signal (PRIN)	Input
21	11	Label Feed	Label Feed	Input
22	-	-	-	-
23	-	-	-	-
24	13	IN_COM	IN_COM	Input
25	-	GND	GND	-

8.11.4 RFID Printing Tips

Recommended non-printable zone

Avoid printing barcodes or characters directly on top of an RFID chip. The uneven surface will negatively affect the print quality.



Note

The tag offset is adjusted from the base reference point. The base reference point differs depending on the media sensor you use. Refer to **Section 6.3.1 About the Base Reference Point** for details.

When gap sensor is used, the tag offset is adjusted from the tip of the label.

When I-mark sensor is used, the tag offset is adjusted from the position after the I-mark.

8.12 Printer Specifications

Specifications are subject to change without notice.

8.12.1 Hardware

Dimensions and Weight	
Width	245 mm (9.65”)
Height	300 mm (11.81”)
Depth	S84-ex: 408 mm (16.06”) S86-ex: 463 mm (18.23”)
Weight	S84-ex: Approximately 13.7 kg (30.2 lbs.) S86-ex: Approximately 15.1 kg (33.3 lbs.)
Power Supply	
Input Voltage	AC 100 V - 240 V ±10%
Frequency	50-60 Hz
Power Consumption	At peak: 180 VA / 180 W (Print ratio 30%) Standby: 30 VA / 25 W Input voltage condition: AC 115 V / 50 Hz
Processing	
CPU	32 Bit RISC-CPU 500 MHz
Flash ROM	48 MB (User area: 8 MB)
SDRAM	64 MB
Receive Buffer	Maximum: 2.95 MB Near full: 2 MB
External Memory	SD card: Maximum 2 GB SDHC card: Minimum 4 GB - Maximum 32 GB USB flash memory: Maximum 32 GB
Operation	
LCD	Graphic LCD (Horizontal 128 dots X Vertical 64 dots) with backlight (White/ orange switchable)
LED	Status: Blue/Red
Environmental Conditions (Without Media and Ribbon)	
Operating Temperature	-5 to 40 °C (23 to 104 °F)
Storage Temperature	-20 to 60 °C (-4 to 140 °F)
Operating Humidity	15 to 85% RH (Non-condensing)
Storage Humidity	15 to 90% RH (Non-condensing)

Print	
Print Method	Direct thermal and thermal transfer
Print Speed	S84-ex 203 dpi: 4 to 16 inches/sec (101.6 to 406.4 mm/sec) 305 dpi: 4 to 14 inches/sec (101.6 to 335.6 mm/sec) 609 dpi: 2 to 6 inches/sec (50.8 to 152.4 mm/sec) S86-ex 203 dpi: 4 to 14 inches/sec (101.6 to 335.6 mm/sec) 305 dpi: 4 to 12 inches/sec (101.6 to 304.8 mm/sec)
Resolution	S84-ex: 203 dpi (8 dots/mm) 305 dpi (12 dots/mm) 609 dpi (24 dots/mm) S86-ex: 203 dpi (8 dots/mm) 305 dpi (12 dots/mm)
Non-printable Area	Pitch direction (Excludes liner) Top: 1.5 mm (0.06”), Bottom: 1.5 mm (0.06”) Width direction (Excludes liner) Left: 1.5 mm (0.06”), Right: 1.5 mm (0.06”)
Printable Area	S84-ex 203 dpi: Length 2500 mm (98.42”) x Width 104 mm (4.09”) 305 dpi: Length 1500 mm (59.05”) x Width 104 mm (4.09”) 609 dpi: Length 400 mm (15.75”) x Width 104 mm (4.09”) S86-ex 203 dpi: Length 1249 mm (49.17”) x Width 167.5 mm (6.59”) 305 dpi: Length 1249 mm (49.17”) x Width 167.5 mm (6.59”)
Print Darkness	Darkness level: 1 to 10
Sensors	
I-mark (Reflective Type)	Sensitivity: Adjustable
Gap (Transmissive Type)	Position and sensitivity: Adjustable
Head Open	Fixed
Top Cover Open	Fixed
Media Sensor Assembly Open	Fixed
Label End Sensor	Detect with I-mark sensor
Ribbon End Sensor	Fixed
Ribbon Supply Sensor	Fixed

8.12.2 Ribbon and Media

Ribbon (Use genuine ribbon made by SATO.)		
Size	S84-ex	Width: 25 mm to 128 mm (0.98” to 5.04”) Length: 450 m (1476.4 ft.) when width is less than 39.5 mm (1.55”) 600 m (1968.5 ft.) when width is equal or more than 39.5 mm (1.55”)
	S86-ex	Width: 59 mm to 177 mm (2.32” to 6.97”) Length: 600 m (1968.5 ft.) when width is equal or more than 59 mm (2.32”)
Wind Direction	Face-out/Face-in	
Roll Diameter	108 mm (4.25”)	
Core Diameter	25.6 mm (1.01”)	

Media (Use genuine media made by SATO.)		
Type	Media roll (Face-in wound/face-out wound), fan-fold media	
Size		
Continuous Mode		
Pitch	S84-ex	203 dpi: 6 to 2500 mm (0.24” to 98.42”) 305 dpi: 6 to 1500 mm (0.24” to 59.06”) 609 dpi: 6 to 400 mm (0.24” to 15.75”)
	S86-ex	203 dpi: 6 to 1249 mm (0.24” to 49.17”) 305 dpi: 6 to 1249 mm (0.24” to 49.17”)
(With Liner) * There is a restriction with the speed for the small pitch label.	S84-ex	203 dpi: 9 to 2503 mm (0.35” to 98.54”) 305 dpi: 9 to 1503 mm (0.35” to 59.17”) 609 dpi: 9 to 403 mm (0.35” to 15.87”)
	S86-ex	203 dpi: 9 to 1252 mm (0.35” to 49.29”) 305 dpi: 9 to 1252 mm (0.35” to 49.29”)
Width	S84-ex	10 to 128 mm (0.39” to 5.04”)
	S86-ex	51 to 177 mm (2.01” to 6.97”)
(With Liner)	S84-ex	13 to 131 mm (0.51” to 5.16”)
	S86-ex	54 to 180 mm (2.13” to 7.09”)

Media (Use genuine media made by SATO.)	
Size	
Dispense Mode	
Pitch	Thermal transfer model: 10 to 356 mm (0.39” to 14.02”) Direct thermal model: 15 to 356 mm (0.59” to 14.02”)
(With Liner)	Thermal transfer model: 13 to 359 mm (0.51” to 14.13”) Direct thermal model: 18 to 359 mm (0.71” to 14.13”)
Width	S84-ex 10 to 128 mm (0.39” to 5.04”) S86-ex 51 to 177 mm (2.01” to 6.97”)
(With Liner)	S84-ex 13 to 131 mm (0.51” to 5.16”) S86-ex 54 to 180 mm (2.13” to 7.09”)
Thickness (Label and liner)	0.05 to 0.31 mm (0.002” to 0.012”)

8.12.3 Interface

Interface	
Standard	USB Interface (Type B) LAN Interface RS-232C Interface IEEE1284 Interface External Signal Interface (EXT) SD card slot USB Interface (Type A)
Optional	Bluetooth Interface Wireless LAN Interface

8.12.4 Built-in Functions

Functions	
Built-in Functions	Status return Graphic Sequential number Form overlay External font registration Character modification Black/white inversion Ruled line Dump list (Hex dump mode) Format registration Outline font Outline modification Zero slash switching Unicode (UTF-8/UTF-16) switching Simple standalone Work shift setting mode XML print WEB browser printer setting (If wireless LAN is installed)
Self-diagnosis Functions	Broken head element check Head open detection Paper end detection Ribbon end detection Ribbon near-end detection Test print Kanji data check Cover open detection Calendar check setting Sensor cover open detection Label near end signal receive and input from the applicator, and report output of label near end status through EXT.
Adjustment Functions	Print Darkness Print Position Media Stop Position Buzzer Volume LCD Brightness
Protective Functions	Head overheating protection function Power supply temperature monitor function

8.12.5 Printer Languages

Printer Languages	
	SBPL SZPL SDPL

8.12.6 Fonts/Symbols/Barcodes

Fonts		
Bitmap Fonts		
	U	9 dots H x 5 dots W
	S	15 dots H x 8 dots W
	M	20 dots H x 13 dots W
	WB	30 dots H x 18 dots W
	WL	52 dots H x 28 dots W
	XU	9 dots H x 5 dots W
	XS	17 dots H x 17 dots W
	XM	24 dots H x 24 dots W
	XB	48 dots H x 48 dots W
	XL	48 dots H x 48 dots W
	OCR-A	S84-ex/S86-ex 203 dpi: 22 dots H x 15 dots W S84-ex/S86-ex 305 dpi: 33 dots H x 22 dots W S84-ex 609 dpi: 66 dots H x 44 dots W
	OCR-B	S84-ex/S86-ex 203 dpi: 24 dots H x 20 dots W S84-ex/S86-ex 305 dpi: 36 dots H x 30 dots W S84-ex 609 dpi: 72 dots H x 60 dots W
	Simplified Chinese Characters (GB18030)	Mincho 16 dots H x 16 dots W 24 dots H x 24 dots W Gothic 24 dots H x 24 dots W
	Traditional Chinese Characters (BIG5)	Mincho 24 dots H x 24 dots W
	Korea Fonts (KSX1001)	Mincho 16 dots H x 16 dots W 24 dots H x 24 dots W
Scalable Fonts		
	Rasterized Font	CG Times CG Triumvirate *Support Codepage 858, Bold/Italic
		SATO Gamma SATO Vica * Support WGL4
		Thai (CP874) Arabic
	Outline Fonts	Alphanumeric, Symbols
Extended Fonts		Font downloaded data (Support 1-byte, 2-byte characters)

Barcodes	
1D Barcodes	UPC-A/UPC-E JAN/EAN-13/8 CODE39, CODE93, CODE128 GS1-128(UCC/EAN128) CODABAR(NW-7) ITF Industrial 2 of 5 Matrix 2 of 5 MSI POSTNET BOOKLAND Intelligent Mail Barcode (IMB) GS1 DataBar Omnidirectional GS1 DataBar Truncated GS1 DataBar Stacked GS1 DataBar Stacked Omnidirectional GS1 DataBar Limited GS1 DataBar Expanded GS1 DataBar Expanded Stacked
2D Codes	QR Code Micro QR Code Security QR Code PDF417 Micro PDF Maxi Code GS1 Data Matrix Data Matrix (ECC200)
Composite Symbols	EAN-13 Composite (CC-A/CC-B) EAN-8 Composite (CC-A/CC-B) UPC-A Composite (CC-A/CC-B) UPC-E Composite (CC-A/CC-B) GS1 DataBar Composite (CC-A/CC-B) GS1 DataBar Truncated Composite (CC-A/CC-B) GS1 DataBar Stacked Composite (CC-A/CC-B) GS1 DataBar Expanded Stacked Composite (CC-A/CC-B) GS1 DataBar Expanded Composite (CC-A/CC-B) GS1 DataBar Stacked Omnidirectional Composite (CC-A/CC-B) GS1 DataBar Limited Composite (CC-A/CC-B) GS1-128 Composite (CC-A/CC-B/CC-C)

Controls	
Rotation	Characters: 0°, 90°, 180°, 270° Barcode: Parallel 1 (0°), Parallel 2 (180°), Serial 1 (90°), Serial 2 (270°)
Barcode Ratio	1:2, 1:3, 2:5, Any ratio is available
Magnification	Bitmap font: Vertical 1 to 36, Horizontal 1 to 36 Barcode: 1 to 36

8.12.7 Options

Options	
	1) Wireless LAN interface kit 2) Bluetooth kit 3) Linerless (Only for S84-ex) 4) RFID (UHF) kit (Only for S84-ex) 5) Ribbon saver (Only for S84-ex)

8.12.8 Accessories

Accessories	
	1) AC power cord 2) Documentations (Quick Guide, Global Warranty Program leaflet, etc.) 3) 14-pin conversion cable 4) Ribbon core

8.12.9 Standards

Standards	
Safety Standards	UL60950-1, CSA22.2 No.60950-1, EN60950-1, GB4943.1, K60950-1
EMC Standards	FCC15B Class A, ICES-003 Class A EN55022, EN55024, KN22, KN24 GB9254, GB17625.1 AS/NZS CISPR 22 EN 300 328
Environmental Standard RoHS	RoHS directive (six hazardous) restricts the use of six hazardous materials listed below. Hexavalent chromium . . . . . .Max. 0.1% Lead and lead compounds . . . . . .Max. 0.1% Mercury and mercury compounds . . . . . .Max. 0.1% Cadmium and cadmium compounds . . . . . .Max. 0.01% Polybrominated biphenyls (PBB) . . . . . .Max. 0.1% Polybrominated diphenyl ethers (PBDE) . . . . . .Max. 0.1%
Wireless LAN (2.45 GHz)	FCC 15B, FCC 15C R&TTE (EN300 328 V1.4:2003-04) (EN301 489 V1.4.1:2002-08) SRRC MIC RCM

8.13 Interface Specifications

For data communication with the host, this printer supports the following interfaces:
You can set the various interface settings of the printer through the **Interface Mode** menu.

- USB (USB type B)
- LAN Ethernet
- RS-232C (DB 9 pins, female)
- IEEE1284 (Amphenol 36 pins)
- External signal (EXT) (DB 25 pins, female)
- Optional Bluetooth
- Optional Wireless LAN

⚠ CAUTION

Do not connect or disconnect the interface cables (or use a switch box) with power supplied to either the printer or host. This may cause damage to the interface circuitry in the printer or host and is not covered by warranty.

Note

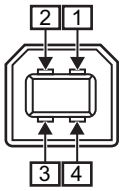
- Bluetooth and wireless LAN are optional interfaces.
- You cannot use the wireless LAN interface and USB interface at a time.

8.13.1 USB Interface

This interface complies with the USB2.0 standard.
Install the USB driver to the computer before use.

Basic Specifications	
Connector	USB Type B connector
Protocol	Status4, Status5
Power Supply	BUS Power through cable
Power Consumption	+5 V at 80 mA

Pin Assignments	
Pin No.	**Description**
1	VBus
2	-Data
3	+Data
4	GND



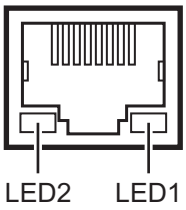
Cable Specifications	
Cable Connector	USB Type B connector
Cable Length	5 m (16.4 feet) or less

8.13.2 LAN Ethernet Interface

Basic Specifications (When IPv4 is selected)	
Connector	RJ-45 Receptacle
Power Supply	Powered from the printer
Protocol	Status3 Status4 (Cyclic response mode) Status4 (ENQ response mode) Status5
IP Address	0.0.0.0 - 255.255.255.255 Initial: 192.168.1.1
Subnet Mask	0.0.0.0 - 255.255.255.255 Initial: 255.255.255.0
Gateway Address	0.0.0.0 - 255.255.255.255 Initial: 0.0.0.0

Basic Specifications (When IPv6 is selected)	
Connector	RJ-45 Receptacle
Power Supply	Powered from the printer
Protocol	Status3 Status4 (Cyclic response mode) Status4 (ENQ response mode) Status5
IP Address	0000:0000:0000:0000:0000:0000:0000:0000 - FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF Initial: 0000:0000:0000:0000:0000:0000:0000:0000
Prefix	0 -128 Initial: 64
Default Router	0000:0000:0000:0000:0000:0000:0000:0000 - FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF Initial: 0000:0000:0000:0000:0000:0000:0000:0000

Link/Status LED		
LED	**Color**	**Description**
LED1	Green	LED lights up for 10 ms when packets are received. LED lights up when the printer established the LINK with Ethernet device.
LED2	Orange	LED lights off when the printer detected the connection to 10BASE-T.
		LED lights up when the printer detected the connection to 100BASE-TX.
		LED lights up when a cable is not connected.



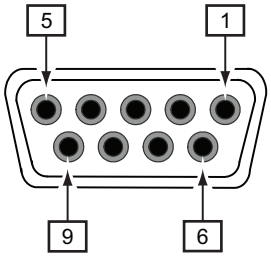
Cable Specifications	
Cable	10BASE-T/100BASE-TX Category 5
Cable Length	100 m (328 feet) or less

Software Specifications	
Supported Protocol	TCP/IP
Network Layer	ARP, IP, ICMP
Session Layer	TCP, UDP
Application Layer	LPD, FTP, TELNET, BOOTP, DHCP, HTTP, SNMP, SNTP

8.13.3 RS-232C Interface

This interface complies with the RS-232C standard.

Basic Specifications	
Asynchronous ASCII	Half-duplex communication Bi-directional communication
Data Transmission Rate	2400, 4800, 9600, 19200 (default), 38400, 57600, 115200 bps
Transmission Form	Start, b1, b2, b3, b4, b5, b6, b7, b8, Stop “b8” will be omitted if using 7 bit oriented.
Data Length	7 or 8 bits (default)
Stop Bit	1 (default) or 2 bits
Parity Bit	ODD, EVEN, NONE (default)
Codes Used	ASCII Character Codes: 7 bits, Graphics: 8 bits
Control Codes	STX (02H), ETX (03H), ACK (06H), NAK (15H)
Connector	DB-9 Female or equivalent
Signal Levels	High = +5 to +12 V, Low = -5 to -12 V
Protocol	Ready/Busy, XON/XOFF, Status3, Status4, Status5 (default) When compatible mode is ON: Status2



Connector Pin Specifications		
Pin No.	**I/O**	**Description**
1	-	Data Carrier Detect
2	Input	Receive Data
3	Output	Transmit Data
4	Output	Data Terminal Ready
5	Reference	Signal Ground
6	Input	Data Set Ready
7	Output	Request To Send
8	Input	Clear To Send
9	-	Not connected

Cable Specifications	
Cable Connector	DB-9 Male or equivalent
Cable Length	5 m (16.4 feet) or less

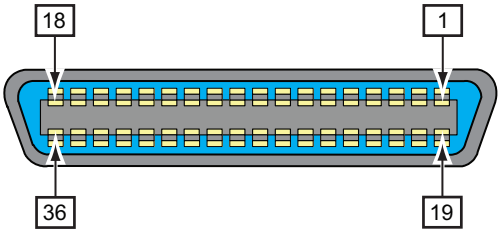
Note

- When using the READY/BUSY control, make sure that the printer is in power on mode before you send the data from the host.
- With communication protocols such as XON/XOFF, STATUS3, STATUS4 or STATUS5, a receive buffer full error will occur when the received data is more than the receive buffer size (2.95 MB). Send data that is less than 2.95 MB while monitoring the status of the printer.
- A parity error will be detected if this error occurs after the reception of ESC+A.

8.13.4 IEEE1284 Interface

This interface complies with the IEEE1284 standard.

Basic Specifications	
Connector	Amphenol 36 pins, female
Signal Levels	High-level: +2.4 to +5.0 V Low-level: +0.0 to +0.4 V
Receive Mode	Single-item buffer, Multi-item buffer
Protocol	Status4, Status5



Connector Pin Specifications		
Pin No.	**I/O**	**Description**
1	Input	STROBE
2-9	Input	DATA 1 - DATA 8 DATA1: LSB DATA8: MSB
10	Output	ACK
11	Output	BUSY
12	Output	PAPER EMPTY/PAPER ERROR
13	Output	SELECT
14	Input	AUTO FEED
15	-	Not in use
16	-	LOGIC Ground
17	-	Frame Ground
18		+5 V
19	-	STROBE RETURN
20-27	-	DATA 1 - DATA 8 RETURN
28	-	ACK RETURN
29	-	BUSY RETURN
30	-	PAPER EMPTY RETURN

Connector Pin Specifications		
Pin No.	**I/O**	**Description**
31	Input	INITIALIZE
32	Output	FAULT
33-35	-	Not in use
36	Input	SELECT INPUT

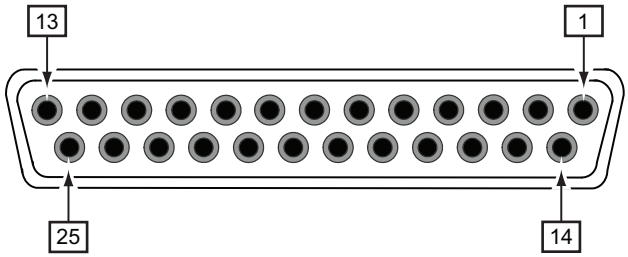
Cable Specifications	
Cable Connector	Amphenol 36 pins, male
Cable Length	1.5 m (5 feet) or less

8.13.5 External Signal Interface (EXT)

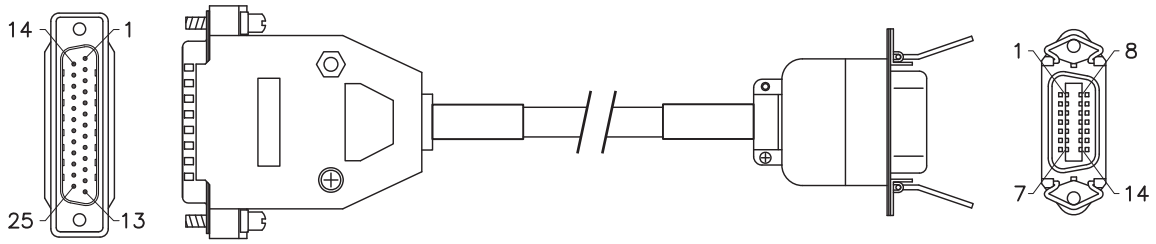
This interface is designed to connect the printer with other peripherals.

Basic Specifications	
Connector	DB 25 pins, female Supplied with 14-pin conversion cable (Amphenol 14 pins, female)
Signal Levels	High-level: +4.2 to +5.0 V Low-level: +0.0 to +0.7 V

DB 25 pins, female connector (printer)



Wiring chart of the 14-pin conversion cable



DB 25 pins, male connector

Amphenol 14 pins, female connector

25 pins		14 pins
1	———	14
4	———	4
5	———	6
6	———	9
8	———	7
12	———	13
24		
13	———	12
14	———	2
15		
16	———	3
17	———	1
18	———	10
20	———	5
21	———	11
SHELL	——— SHIELD ———	SHELL

Connector Pin Specifications			
Pin No.		**I/O**	**Description**
(25 pins)	**(14 pins)**		
1	14	-	Frame Ground
2	-	-	Vcc +5 V
3	-	-	-
4	4	Output	Machine Error: Outputs a low signal when an error such as the head open error is detected.
5	6	Output	Print end signal (PREND): Outputs a signal when the media print is completed.
6	9	Output	Online*3: Outputs a low signal when the printer is in offline mode.
7	-	Input*2	Label Near End: Printer received a label near end signal when a low signal is detected.
8	7	Input*2	Reprint signal (PRIN2): Prints the previously printed content again when a low signal is detected.
9	-	-	-
10	-	-	-
11	-	-	OUT_COM: Ground of peripherals
12	13	-	Vcc +5 V
13	12	-	+24 V ± 10%
14	2	-	GND: Reference Signal Ground
15	2	-	OUT_COM: Ground of peripherals
16	3	Output	Ribbon End: Outputs a low signal when the ribbon end is detected.
17	1	Output	Paper End: Outputs a low signal when the paper end is detected.
18	10	Output	Ribbon Near End: Outputs a high signal when the ribbon near end is detected.
19	-	-	-
20	5	Input*2	Print start signal (PRIN): Prints one media when a low signal is detected.
21	11	Input*2	Label Feed: Feeds one media when a low signal is detected.
22	-	-	-
23	-	-	-
24	13	Input	IN_COM*1: Power supply from peripherals
25	-	-	GND: Reference Signal Ground

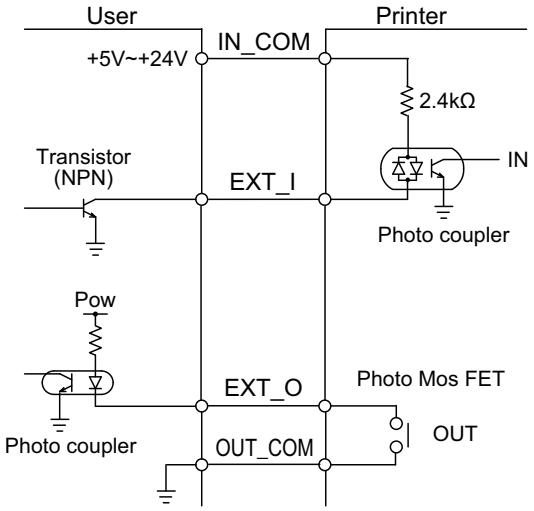
Note

- You can set the external signal type (TYPE1 to TYPE4) for PREND output signal of pin No. 5. Refer to the **EXTERNAL SIGNAL** screen of the **Advanced Mode** menu for details.
- You can set the pin number for input and output through the **INPUT SIGNAL/OUTPUT SIGNAL** screen of the **Advanced Mode** menu.

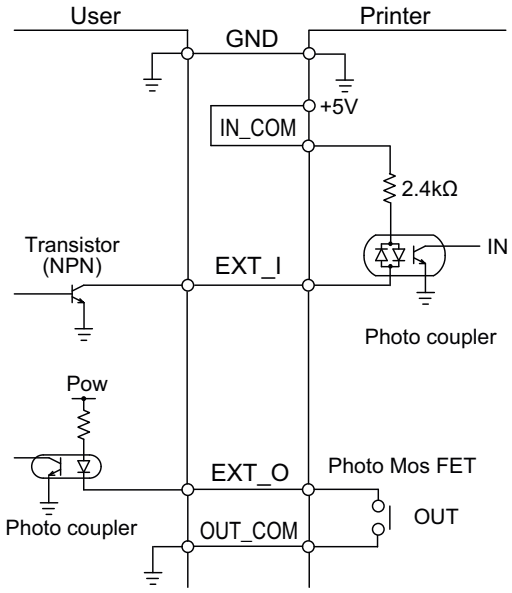
*1 When using the 14-pin conversion cable, do not connect the power pin to [IN_COM] pin. The [IN COM] pin is connected to 5 V in cable.
*2 These input signal terminals can be connected to the open collector input devices.
*3 This is online output signal when MODE2 is selected in the EXT 9PIN SELECT screen of the service mode. The signal outputs the status of the remaining print existing when MODE1 is selected.

Input/Output circuit diagram of 25 pins external signal interface (DB 25 pins, female terminal)

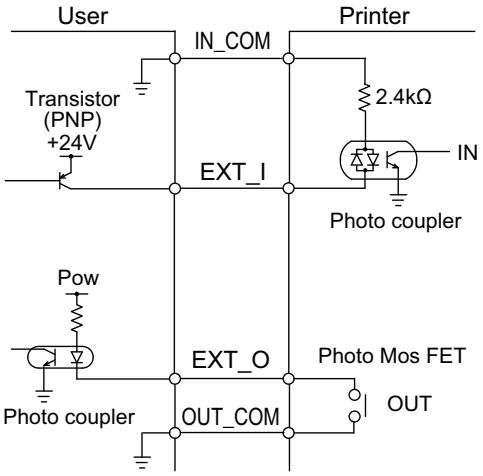
When the output from the user is NPN transistor output
[Power is supplied from the user]



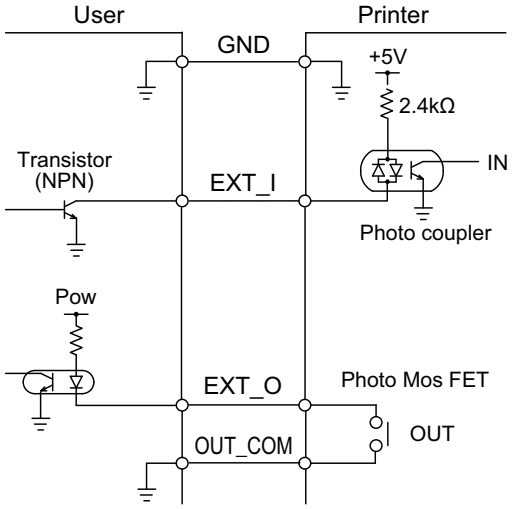
[Power is supplied from the printer]



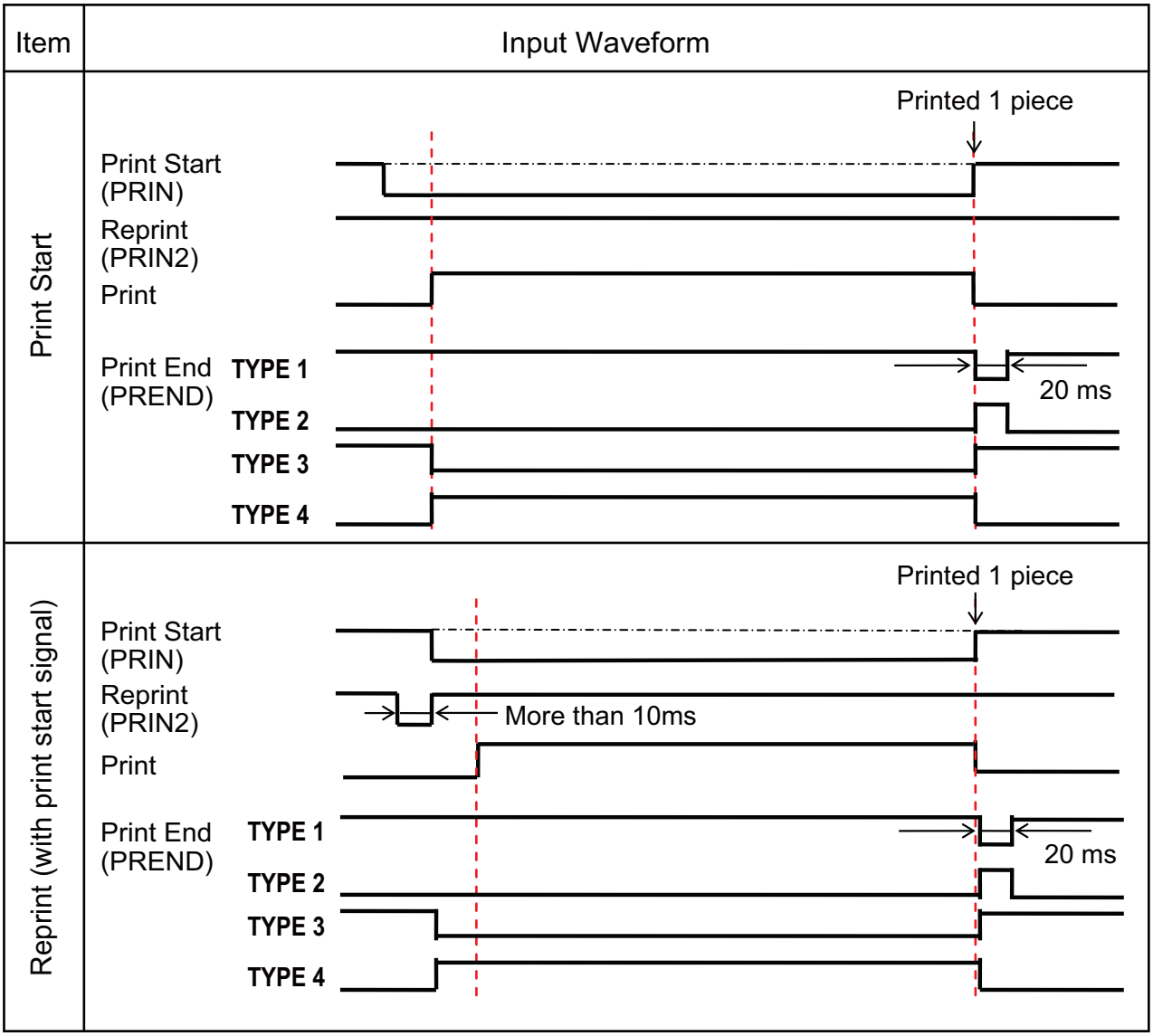
When the output from the user is PNP transistor output



Input/Output circuit diagram of 14-pin external signal interface (Amphenol 14 pins, female connector)



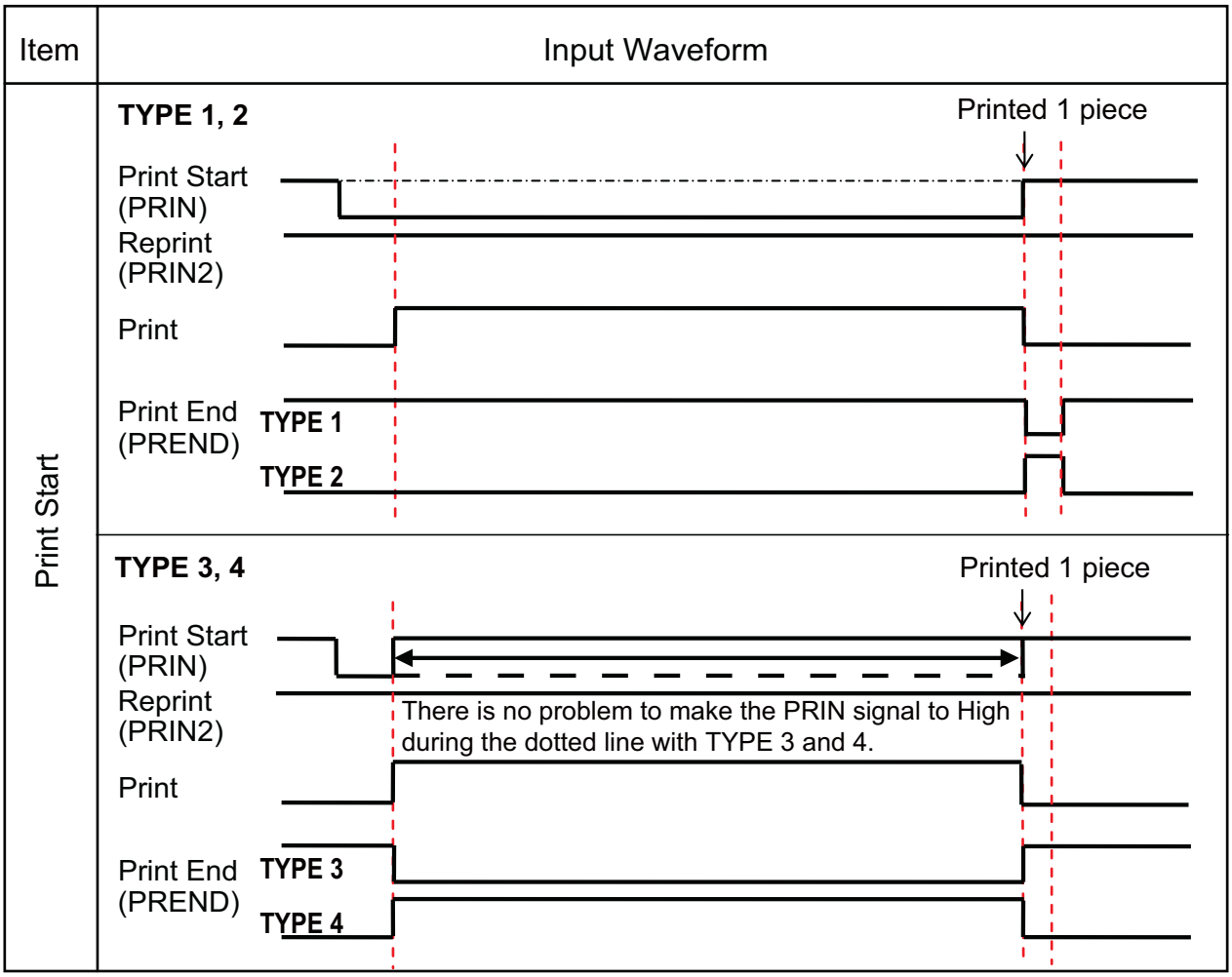
Timing Chart of the EXT Input Signal

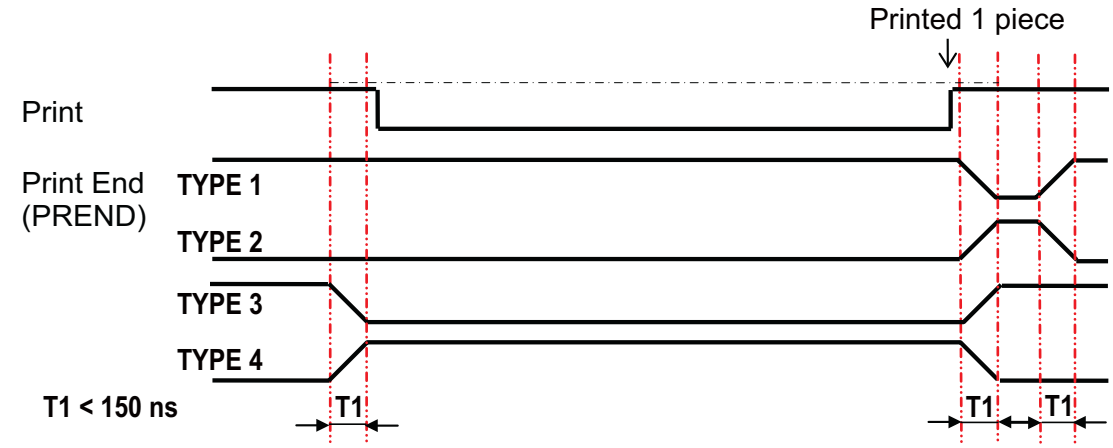


Supplementary explanation

- Keep the print start signal (PRIN) to “Low” until print end signal (PREND) is output. Refer to the below **Maintaining the Print Start Signal (PRIN)** timing chart.
- Keep the output reprint signal (PRIN2) for more than 10 ms. When signal is output for shorter than 10 ms, and reprint signal is not acknowledged, the printer does not perform reprinting.

Maintaining the Print Start Signal (PRIN)

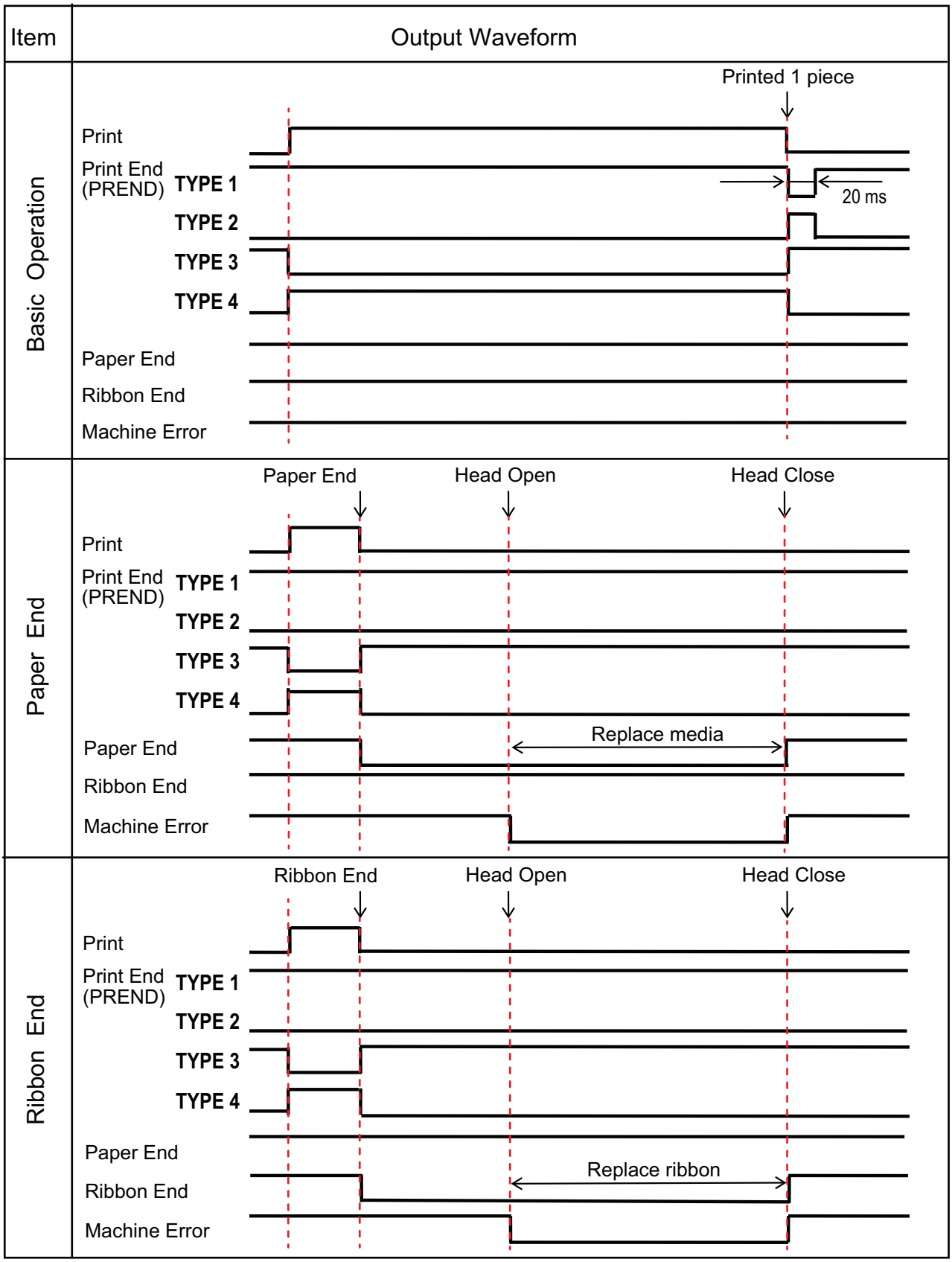


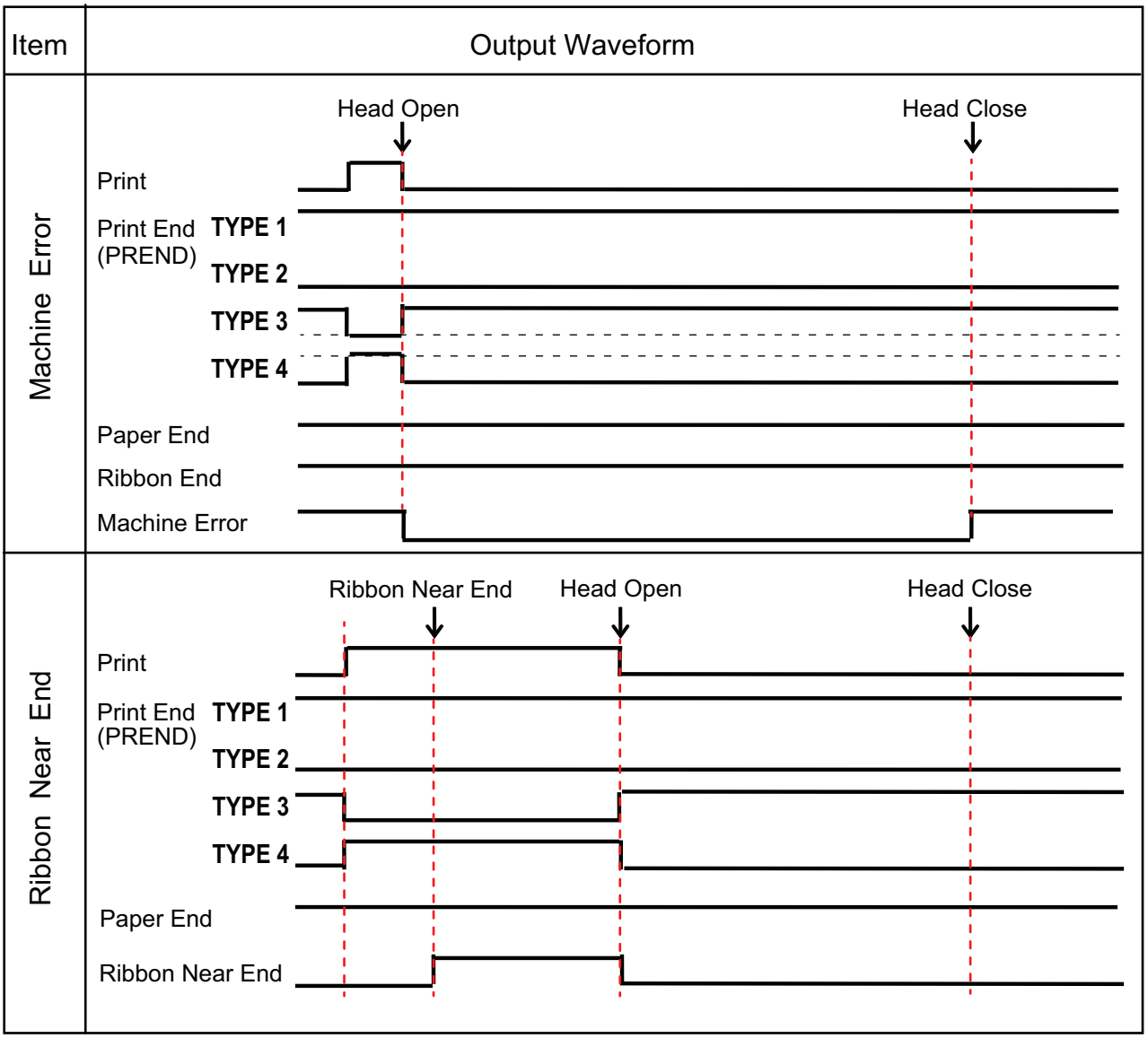
Item	Timing Chart
PREND Signal	

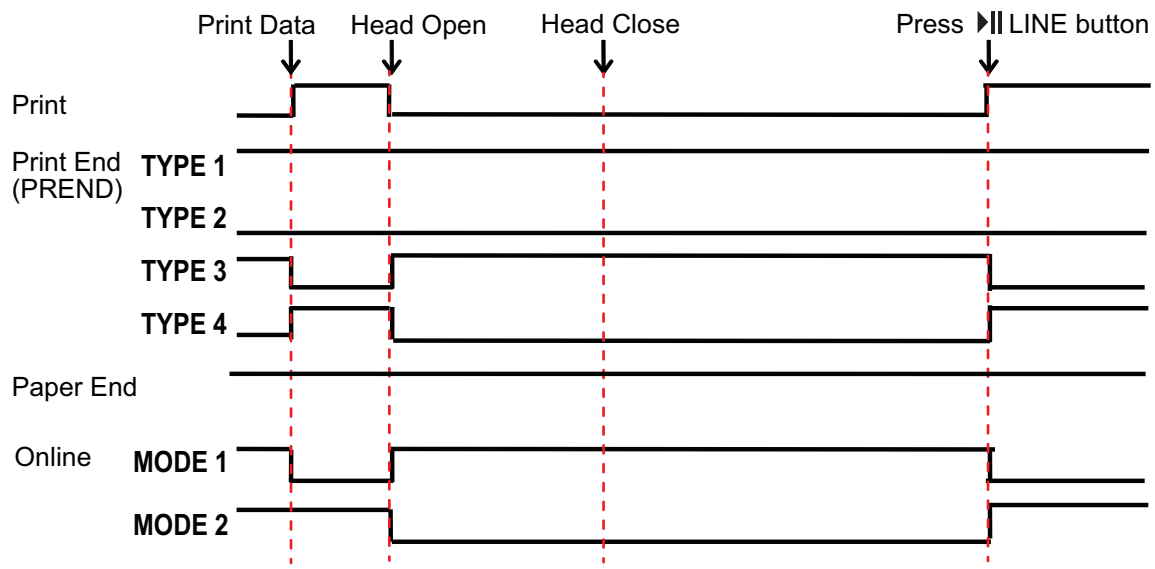
Rise or fall time (T1) of PREND signal is less than 150 ns. You have to consider the time when outputting the signal from the connected devices.

- When the print start signal and reprint signal are output simultaneously, the print start signal is enabled and the printer does not perform reprinting.
- The reprint signal is valid only from the time of the print operation end (QTY=0) until the next print data reception. Other than that, the printer does not perform reprinting.

Timing Chart of the EXT Output Signal




Item
Output Waveform
Machine Error
Head Open
Head Close
Print
Print End (PREND)
TYPE 1
TYPE 2
TYPE 3
TYPE 4
Paper End
Ribbon End
Machine Error
Ribbon Near End
Ribbon Near End
Head Open
Head Close
Print
Print End (PREND)
TYPE 1
TYPE 2
TYPE 3
TYPE 4
Paper End
Ribbon Near End

Item	Output Waveform
Online	 Select MODE1 or MODE2 in the EXT 9PIN SELECT display of the SERVICE MODE menu.

8.13.6 Bluetooth Interface

This interface complies with the Bluetooth Ver. 2.0+EDR standard.

Basic Specifications	
Signal Level	Class 2
Communication Distance	5 m (16.4 feet)
Profile	Serial Port Profile
Security Level	Level 1 No authentication (default) Level 2-1 PIN code authentication, service level Level 2-2 PIN code authentication, service level Level 3 PIN code authentication, link level
PIN Code	1 to 16 characters consisting of ASCII code (20H, 21H, 23H to 7EH)
Disconnect Timeout (LMP layer)	60 seconds

8.13.7 Wireless LAN Interface

This interface complies with the IEEE802.11b/g/n standard.

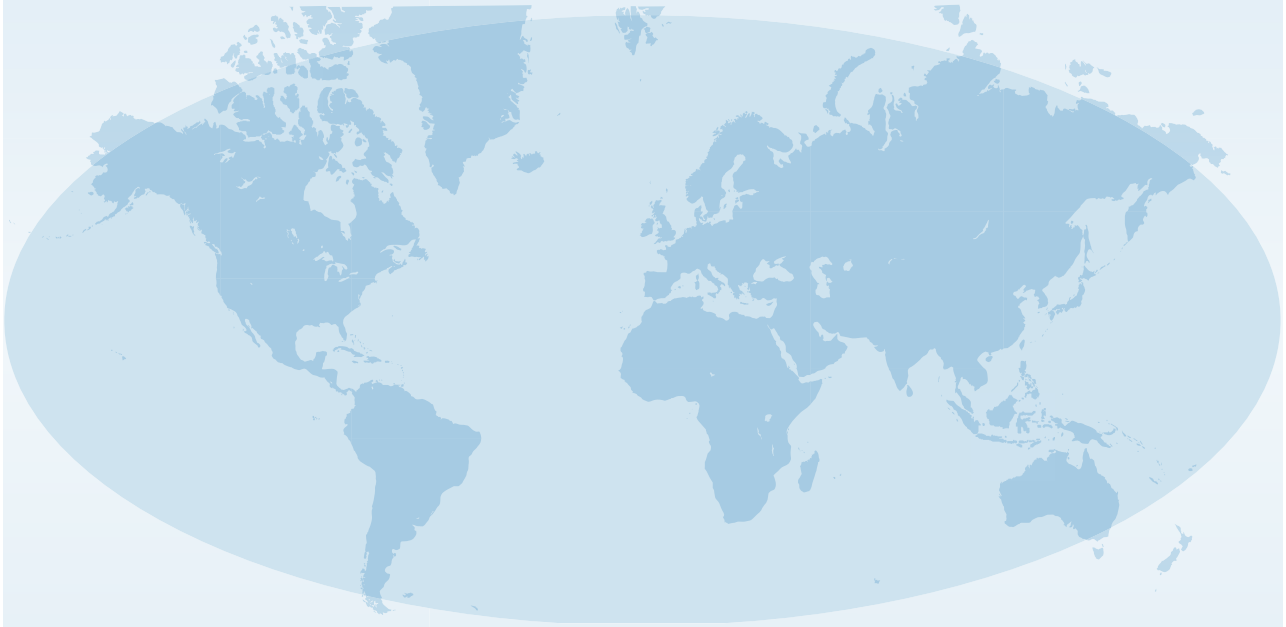
⚠ CAUTION

Before using wireless LAN near medical devices and facilities, consult your system administrator.

Basic Specifications	
Protocol	Status3, Status4, Status5
IP version	IPv4
IP Address	IPv4: 0.0.0.0 - 255.255.255.255 Initial: 192.168.1.1
Subnet Mask	IPv4: 0.0.0.0 - 255.255.255.255 Initial: 255.255.255.0
Gateway Address	IPv4: 0.0.0.0 - 255.255.255.255 Initial: 192.168.1.2
Data Transfer Method	802.11n: max 135 Mbps 802.11b: max 11 Mbps 802.11g: max 54 Mbps **Note** These are the logical values based on the wireless LAN specifications and are not the actual data transfer speeds.
Communication Distance	Indoor: max 100 m Outdoor: max 240 m Communication distance depends on environment.
Frequency Band	2.4 GHz (2.412 to 2.485 GHz)
Communication Channel	The number of channels you can set varies depending on the region where you use the printer.
SSID	Any alphanumeric character (maximum 32) Default: SATO_PRINTER
Authentication	Open System Shared Key WPA/WPA2 Perform the RADIUS server authentication using 802.1x (EAP-TLS, LEAP, EAP-TTLS, EAP-PEAP, EAP-FAST protocol)
Encryption	None WEP (64 bits/128 bits) TKIP (WPA-PSK/WPA2-PSK, WPA-802.1x/WPA2-802.1x authentication) AES (WPA-PSK/WPA2-PSK, WPA-802.1x/WPA2-802.1x authentication)

Basic Specifications	
Communication Mode	Infrastructure Ad Hoc *In IEEE802.11n, only Infrastructure mode is available.

Software Specifications	
Supported Protocol	TCP/IP
Network Layer	ARP, IP, ICMP
Session Layer	TCP, UDP
Application Layer	LPD, FTP, BOOTP, DHCP, HTTP



Extensive contact information for worldwide SATO operations can be found on the Internet at **www.satoworldwide.com**

SATO